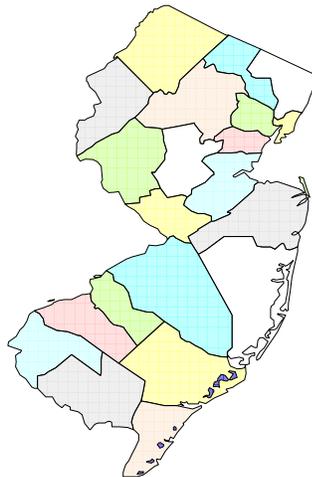


# Capital Investment Strategy Fiscal Years 2007-2011



**NEW JERSEY DEPARTMENT OF TRANSPORTATION  
NJ TRANSIT**

**March 31, 2006**

**Governor Jon Corzine**

**Commissioner Kris Kolluri, Esq.**

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**NJ TRANSIT**

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# Introduction

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The Capital Investment Strategy for Fiscal Years 2007 – 2011 lays out capital investment goals for the New Jersey Department of Transportation and the New Jersey Transit Corporation. This report is a companion document to the Proposed Capital Program for Fiscal Year 2007. The Proposed Capital Program details the projects to be funded during the next fiscal year. The Capital Investment Strategy discusses the goals and longer-term strategy behind those project choices.

The first section of the report describes the capital investment strategy for programs funded by the Department of Transportation (NJDOT). The second section describes the capital investment strategy for NJ TRANSIT.

The Capital Investment Strategy takes advantage of increased state and federal funding for transportation. The annual program provided by the New Jersey Transportation Trust Fund has been increased to \$1.6 billion under Governor Corzine's plan to "reform, replenish, and grow" the Trust Fund. Additional federal resources are also available under the federal SAFETEA-LU authorization act.

The NJDOT section of the report discusses programs in areas such as bridge preservation, roadway preservation, safety, congestion, bicycle and pedestrian needs, aviation, goods movement, and local aid. Most projects and programs funded by NJDOT can be classified into one of these areas, but it is important to note that many projects serve more than one purpose. A highway rehabilitation project may include intersection improvements that relieve congestion bottlenecks. A bridge replacement project may provide improved sight distance and other measures that enhance

safety.

For some program areas, NJDOT's capital investment strategy methodology has developed to the point that quantitative assessments can be made of the effect of different funding levels on the future condition of elements of the transportation system. NJDOT has pioneered the use of "management systems" to analyze needs and plan for the use of resources for bridges, highway pavement, congestion, safety, and drainage. Other areas are subject to a more qualitative analysis.

Every capital program involves the making of choices and tradeoffs. As the Capital Investment Strategy and the Proposed Capital Program both demonstrate, NJDOT is committed in the near future to a "Fix-it-First" strategy of continued high funding levels for safety, bridge and roadway preservation needs and the implementation of a wide spectrum of innovative and effective means of fighting congestion and improving mobility and accessibility. NJDOT is also committed to vigorously pursuing a tighter link between transportation and land use, as exemplified in the "NJFIT: Future in Transportation" initiative.

As a corollary to pursuing the goals of the Capital Investment Strategy, NJDOT is also working to reduce the pressure on choices and tradeoffs through greater efficiencies in project design and delivery. By "rightsizing" projects to ensure that they are not overdesigned and by looking for ways to speed production (such as the HyperBuild initiative), NJDOT hopes to produce smarter, faster and cheaper solutions to transportation problems.

The NJ TRANSIT section of the report outlines the goal of NJ TRANSIT's Capital In-

vestment Strategy (CIS) to improve the reliability, frequency and geographic reach of the state's transit network to increase transit ridership, promote smart growth and drive the state's economy.

In addition to increased capacity of rail and bus right of way, the Capital Investment Strategy calls for expanded commuter parking, the , creation of new regional inter-modal park & rides, and expanded rail fleet and yard capacity.

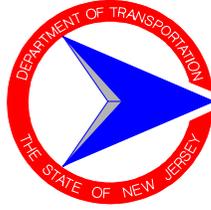
First, the \$18.8B Ten-Year Capital Investment Strategy calls for continued investment in the state's transit infrastructure to achieve and maintain a state-of-good-repair. The CIS targets infrastructure rehabilitation, bus and rail equipment replacements and technology improvements to modernize customer information and fare collection systems.

Second, the Ten-Year Capital Investment Strategy calls for the tremendous need to grow core transit system capacity to serve ambient market growth and new customers. Increasing rail capacity along the Northeast Corridor into Midtown Manhattan is the keystone of future capacity.

In addition to increased capacity of rail and bus right of way, the Capital Investment Strategy calls for expanded commuter parking, the creation of new regional inter-modal park & rides, and expanded rail fleet and yard capacity.

Finally, the CIS also calls for selective service expansions that work with and fully complement prior investments.

NJ TRANSIT's Capital Investment Strategy will guide transit investments in New Jersey for the next ten years. Implementing the CIS will deliver an improved transit system to the state, one of greater reach, reliability and level of service.



# **NJ DEPARTMENT OF TRANSPORTATION**

## **CAPITAL INVESTMENT STRATEGY**

# Bridge preservation

## New Jersey's highway bridges

There are 2600 bridges on the New Jersey state highway system, many of which will require replacement or extensive rehabilitation in coming years. These structures are vital links in our transportation system and play an important role in New Jersey's economic development. Restoring deficient bridges to good condition continues to be a fundamental element of NJDOT's capital investment strategy.

The need to rebuild many bridges is a function of heavy traffic volume, weather conditions and structure age. When structures reach 50 years old, the need to replace or rehabilitate becomes more imminent. New Jersey's average bridge age is 47 years—nine years more than the national average. About 40 percent of our bridge population is more than 50 years old.

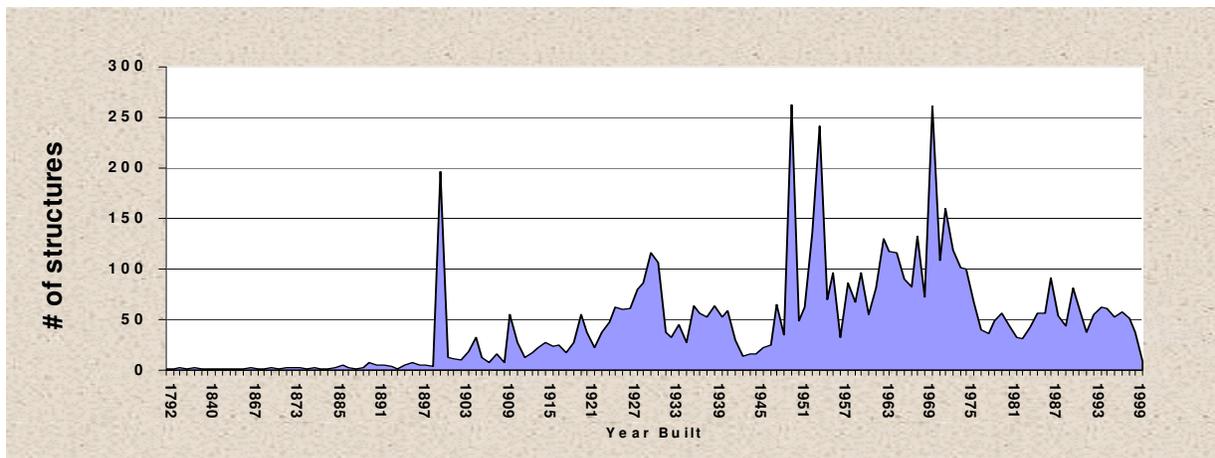
As shown in the chart below, a considerable number of bridges were added to the state highway system in the 1950s as the interstate system and other new roads were built to support widespread growth and development. These structures are

beginning to reach the 50-year old mark, and many are now falling into the structurally deficient category.

As a result of our substantial investment in the bridge program over the past several years, about 83 percent of our bridges (state, county and local) are in acceptable condition. Our major bridges (defined as those on the federally designated National Highway System) are in even better overall condition, with 90 percent ranked as acceptable. This compares reasonably well with the national average and with other states in our region.

It is critical to an understanding of bridge conditions to note that the "backlog" of deficient bridges is not static. While some bridges are being repaired and being reclassified from "unacceptable" to "acceptable," other bridges are continuing to age and will be reclassified from "acceptable" to "unacceptable." That is why even if we continue to fund the bridge program at high levels—or even increase those levels—we expect a drop in overall

### Age of Structures on State Highways



March 2001 data

bridge ratings over the next several years. More details on the “high-cost bridge” problem will be given later.

A more extensive wave of new bridge projects is on the horizon and will require major improvements within the next ten years. More details on the “high-cost bridge” problem will be outlined in a subsequent section. Beyond this point, it is projected that many more bridge needs will emerge over the next several decades, also requiring costly investments. This trend represents more bridge needs than expected state and federal funds available for bridge improvements—now and in the future. Obviously, this is a serious dilemma that impacts the state economy. A more innovative investment strategy must be developed to reduce, and possibly eliminate, the backlog of structurally deficient bridges and upgrade New Jersey’s transportation infrastructure to a higher state of good repair.

# Bridge preservation

## Meeting the need

To fully address the bridge need, NJDOT has set objectives based on broad performance measures:

Objective 1. Reduce structural deficiencies on state maintained bridges on the Federal Select List.

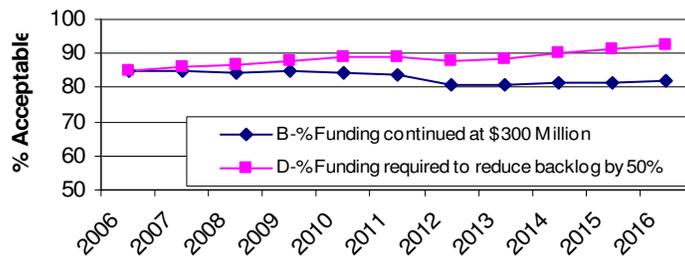
Objective 2. Reduce functional obsolescence on state maintained bridges on the Federal Select List.

NJDOT’s long-term goal continues to be to move the entire population of bridges into the “acceptable” range and to keep them there. Given the sheer number of bridges and the ongoing aging and deterioration process, this will be a huge effort requiring many years to achieve. A closer-term objective, as identified by the Legislature in the Trust Fund amendments of 2000 (N.J.SA 27:1B-22.b) is to reduce the backlog by half over 10 years.

How do we reduce the backlog? First, it is important to remember that the backlog is not static. If nothing is done, the backlog will grow significantly. Even with substantial investment, the backlog will grow somewhat. As shown in the graph below, at current investment levels of about \$300 million a year, the bridge acceptability rate is projected to decrease from 81 percent to 77 percent over the next ten years. Therefore, a “flat” funding projection into the future would result in an increase in the bridge population that is structurally defi-

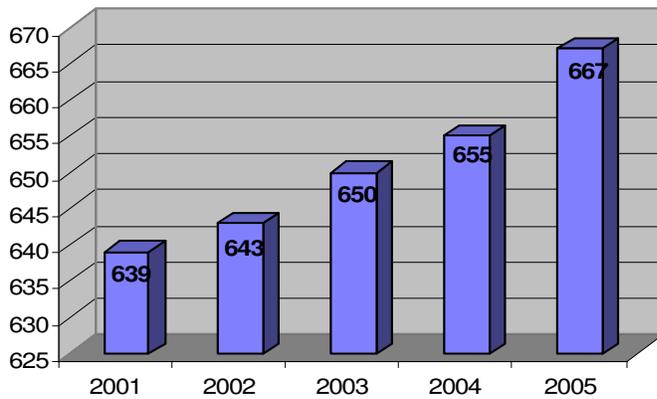
cient. Reducing the backlog in half in 10 years (to an acceptable rate of 93 percent) would require an annual investment of about \$700+ million—an increase of about 140 percent.

State Maintained Bridge Replacement Needs  
(Structurally Deficient only)



In addition to measuring the performance of structurally deficient bridges alone, functionally obsolete bridges were also included in the analysis. Measuring the number of both structurally deficient and functionally obsolete bridges conforms better with the measures used both by most other states and by the Federal Highway Administration. FHWA calls these “Select List” bridges. Structural deficiency is the current appraisal of a bridge’s physical structural condition. Functional obsolescence is a measure of how a bridge meets current geometric design standards and how efficiently it handles today’s traffic volumes and types (which includes an overall structural evaluation). Using this measure, 667 out of a total population of 2600 bridges are currently rated as unacceptable. In other words, 74% of the bridge population is in an acceptable condition. Since 2001, the number of unacceptable bridges has risen from 639 (see following chart).

### State Maintained Bridges on the Federal Select List



A performance analysis was conducted using all deficient bridges (structurally deficient and functionally obsolete), as shown in the graph below.

NJDOT is also pursuing a variety of measures to address bridge deficiencies within the limits of available funding. There is a new emphasis on investing funding based on the following strategy:

1. Invest in priority bridge repairs at funding levels above what has been previously provided in all categories - bridge replacements, bridge deck replacement/rehabilitation, moveable bridge repairs, bridge painting,

and bridge preventive maintenance (repairs aimed at extending the service life).

2. Invest in interim repair contracts, on an annual basis, to extend the serviceability of high-cost bridges, rather than expending significant planning and preliminary design funds for bridge replacement projects that may not be funded for many years.

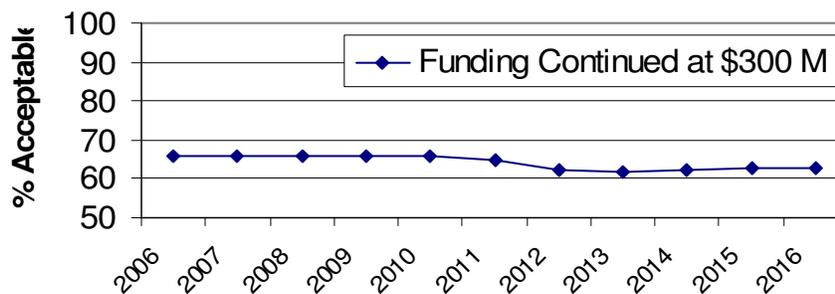
Rehabilitating a bridge—instead of tearing it down and building a new one—is usually cheaper and may also fit better with local community desires. There are tradeoffs, however. Building a new bridge often

provides an opportunity to alleviate traffic problems and may avoid the necessity of detour routes during construction.

NJDOT is also stretching available financial resources through the use of innovative finance for high-cost bridges and through seeking lower-cost solutions to maintain bridges in good working order. Some of these other programs are discussed on another page.

To meet the bridge challenge, NJDOT plans to increase investment in state bridges from a level of about \$350 million a year to an average of about \$500 million a year over the next five years.

### State Maintained Bridge Replacement Needs (Both Structurally Deficient and Functionally Obsolete)



# Bridge preservation

## High-cost bridges

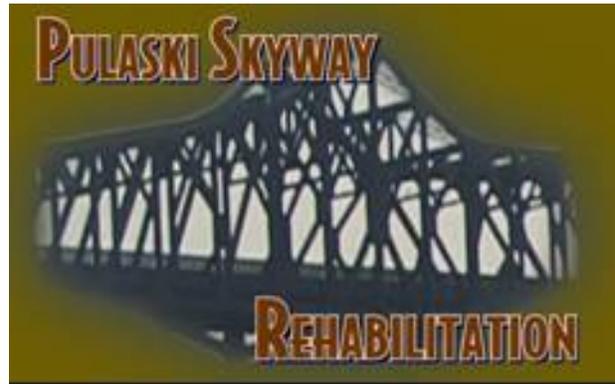
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Over the past century, New Jersey was knit together by the construction of major highway bridges, which still connect us with each other and the rest of the country and the world today. Many of these bridges have reached the age at which they need major rehabilitation or replacement. Addressing these bridge needs raises significant design and engineering problems. It also raises significant funding problems.

Bridge rehabilitation and replacement improvements in this category ("high-cost bridges" are defined as those costing \$50 million or more for construction) currently represent an outstanding total need of about \$3 billion in construction costs. These huge financial needs, together with other necessary competing bridge and roadway improvements, have created a serious funding dilemma. Initiating bridge replacement projects that cannot feasibly be funded in the short term is counterproductive.

NJDOT is pursuing a strategy of (1) funding high-cost bridge rehabilitation and replacement projects according to their priority, as funding permits, (2) using innovative funding for at least some of these bridges, (3) "rightsizing" some projects to reduce the cost by reducing the scope of work, and (4) pursuing smaller projects to extend the life of other bridges.

One major bridge which is being reviewed for alternative treatments is the Pulaski Skyway. NJDOT has convened a task force to look at both long-term alternatives and short-term repairs for this major historic structure carrying Route 1&9 between Newark and Jersey City. At present, a rolling program of small-scale projects is envisioned.



There are seven major bridges on the current "high-cost" list awaiting funding (and possible "rightsizing" into life-extension projects):

- Route 1&9T, St. Paul's Avenue Bridge—Major truck route and key link in the Portway system. Construction cost \$180 million.
- Route 3 bridge over the Passaic River—Many structural, operational, and safety deficiencies; traffic bottleneck on one of New Jersey's most congested corridors. Replacement will cost approximately \$255 million.
- Route 7 bridge over the Hackensack River (Wittpen Bridge)—Key traffic and goods movement link; part of Portway. Construction cost estimate \$372 million.
- Route 36, Highlands Bridge—Replacement of deficient bridge; major tourist and shore evacuation route. Estimated cost \$81 million.
- Route 52 Causeway, contracts A and B—Reconstruction of the causeway connecting Ocean City and Somers Point, including replacement of deficient bridges. Major tourist and shore evacuation route. Total construction cost estimated at \$410 million.

million. This project will be funded using the federal innovative finance program called "GARVEES," in which federal bridge funding will be programmed over several years to avoid excessive cost concentrations in a few years.

- Route 72, bridge over Manahawkin Bay—Another key tourist and shore evacuation link. Estimated cost \$240 million.
- Route 139 viaduct, contracts #2 and #3—A series of construction contracts rebuilding the viaducts leading to the Holland Tunnel. Key interstate link. Total construction costs for these two contracts estimated at approximately \$235 million.

The following ten structures have been identified as the "next generation of high cost bridges:"

NEXT GENERATION of HIGH COST BRIDGES  
(UNFUNDED)

<u>NAME</u>	<u>CONSTRUCTION COST</u>
1. Pulaski Skyway	\$350 M
2. Route 1&9T over Passaic River	\$125 M
3. Route 1&9T over Hackensack River	\$160 M
4. Route 3 EB & WB over Hackensack River	\$ 75 M
5. Route 30 over Beach Thorofare	\$ 50 M
6. Route 35 over Cheesequake Creek	\$ 75 M
7. Route 37 EB over Barnegat Bay (Mathis Bridge)	\$150 M
8. Route 46 over Hackensack River	\$130 M
9. NJ Route 47 over Grassy Sound	\$ 65 M
10. NJ Route 495 Viaduct over US 1&9	<u>\$100 M</u>
TOTAL COST	\$1.280 BILLION

# Bridge preservation

## Bridge programs

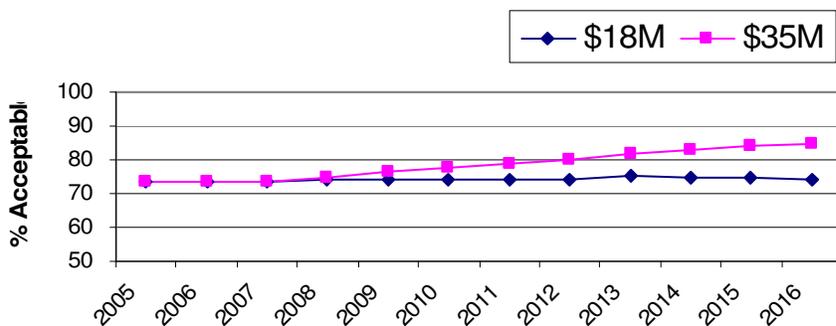
Along with the more expensive bridge rehabilitation and replacement projects, NJDOT implements several programs aimed at maintaining or improving bridge conditions:

- Bridge deck rehabilitation— Sometimes only the deck of a bridge—the part that actually carries the traffic—is deficient. In these cases, NJDOT is often able to solve the problem through the bridge deck rehabilitation program, which offers cheaper, faster repairs. A performance analysis was conducted for bridge deck replacement needs among deck deficient, state maintained bridges only. The analysis indicates that an investment of approximately \$18M per year will result in no change in the acceptability rate, therefore maintaining the current condition level over the next ten years as shown in the graph below:

An investment of approximately \$35M is estimated to result in about a 10% improvement in reducing deficient bridge deck area. The Draft FY07 Capital Program allocates approximately \$30M in FY07 for bridge deck rehabilitation and replacements and about \$20M per year for the next several years.

- Bridge painting—Steel bridges require strong, weather-resistant coatings to protect them from corrosion. Many bridges were once painted with lead-based paints. Replacing lead-based paints with modern, environmentally friendly paints requires expensive containment and disposal. About 29% of the population of state highway bridges still needs recoating. In past analyses the performance measurement has been reduction of the backlog, expressed in remaining tons of steel requiring treatment. The new performance measure is “linear feet of deteriorated painted beam”.

**State Maintained Bridge Rehabilitation Deck Replacement Needs**

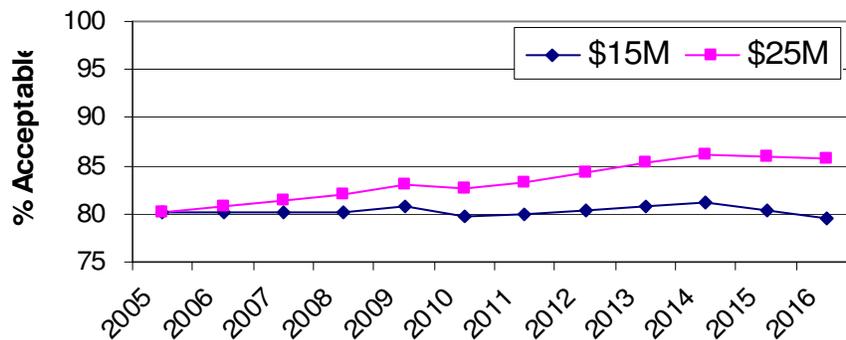


NJDOT is planning to spend about \$20 million per year on bridge painting, which functions to slow down the rate of deterioration over time. At this rate, using the new performance measure, the acceptability level will improve over the next 10 years as shown in the graph below. An increased investment

level to approximately \$25M per year is projected to result in notable increase in the acceptability.

- Bridge scour program—Bridges crossing waterways are subject to damage from extreme stream flows during flooding, which can wash away underwater support structures. NJDOT is working with the Federal Highway Administration (FHWA) to identify bridges most at risk and to design and implement underwater protection.
- Bridge safety, movable bridge repair—This new program will address critical needs to upgrade the safety appurtenances of New Jersey’s moveable bridges.
- Emergency bridge repairs—This program funds Priority One bridge repair needs. NJDOT intends to fund this program at \$20 million per year, twice the previous level.
- Bridge betterments program—This program funds minor repair work done by contract.

### State Maintained Bridge Painting Needs



# Bridge preservation

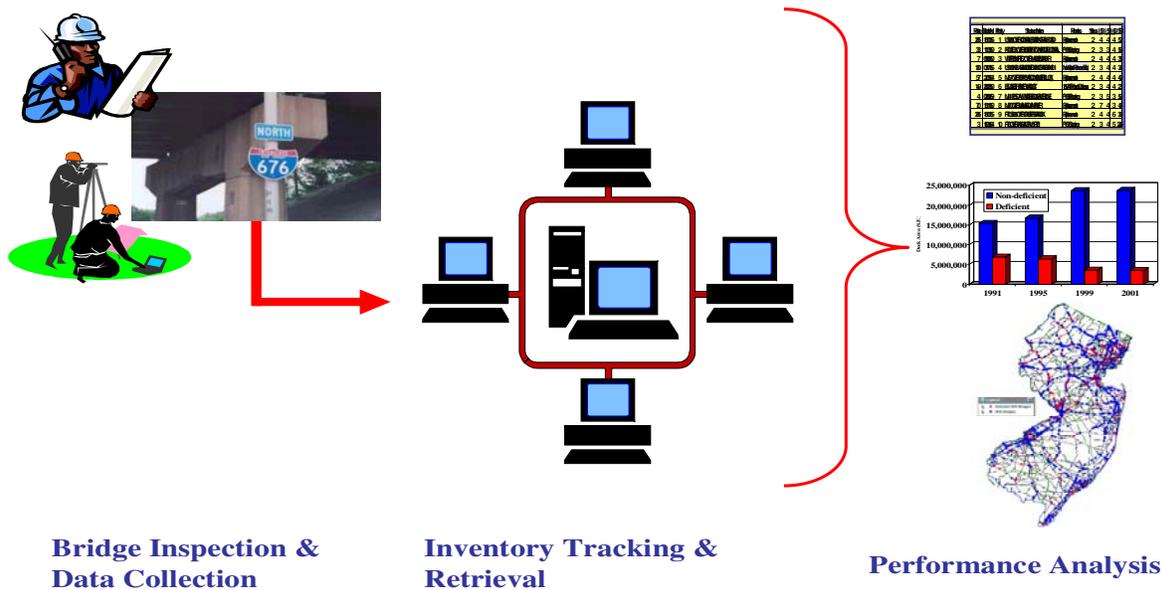
## Bridge management system

The capital investment strategy for bridges, as well as selection of new bridge projects and the prioritization of existing bridge projects, is in large part a product of NJDOT's bridge management system. The bridge management system tracks detailed information on the status of every bridge in the state and on overall system conditions and trends. Every bridge is inspected at least every other year. The inspection includes a careful engineering examination of every component of the bridge—the substructure,

ant contracts, costs \$15 to \$20 million per year.

What is "acceptable"? For capital investment strategy purposes, NJDOT relies on federally developed definitions of structural deficiency and functionally obsolescence. These performance measures, in addition to others that are used to evaluate the status of the bridge population over time, are listed below:

### Bridge Management System



superstructure, and deck. This data is fed into a computerized system for further evaluation. The analysis is used both to initiate specific bridge rehabilitation and replacement projects and to develop systems level projections. The bridge inspection process, which is done under consult-

#### Performance Measures:

- 1-Number of Bridges: Structurally Deficient
- 2-Bridge Deck Area: Structurally Deficient
- 3-Number of Bridges: Functionally Obsolete
- 4-Bridge Deck Area: Functionally Obsolete

A bridge is considered structurally deficient

if it scores a low rating on one or more of several engineering standards. It is important to note that a structurally deficient bridge is not an unsafe bridge. Structural deficiency indicates a need for possible rehabilitation or replacement. If a bridge is determined to be unsafe, it is closed to traffic. If a bridge is so deficient that it is in danger of rapid deterioration, it may be posted for maximum load. Functional obsolescence is a measure of how a bridge meets current geometric design standards and how efficiently it handles today's traffic volumes and types (which includes an overall structural evaluation).

For capital investment strategy purposes, NJDOT also factors "deck square footage" of each bridge into the scoring, so as to give weight to the size as well as the number of deficient bridges.

The bridge management system also incorporates expected deterioration rates into its projections, so that the "backlog" of bridges in unacceptable condition is properly seen as a moving target.

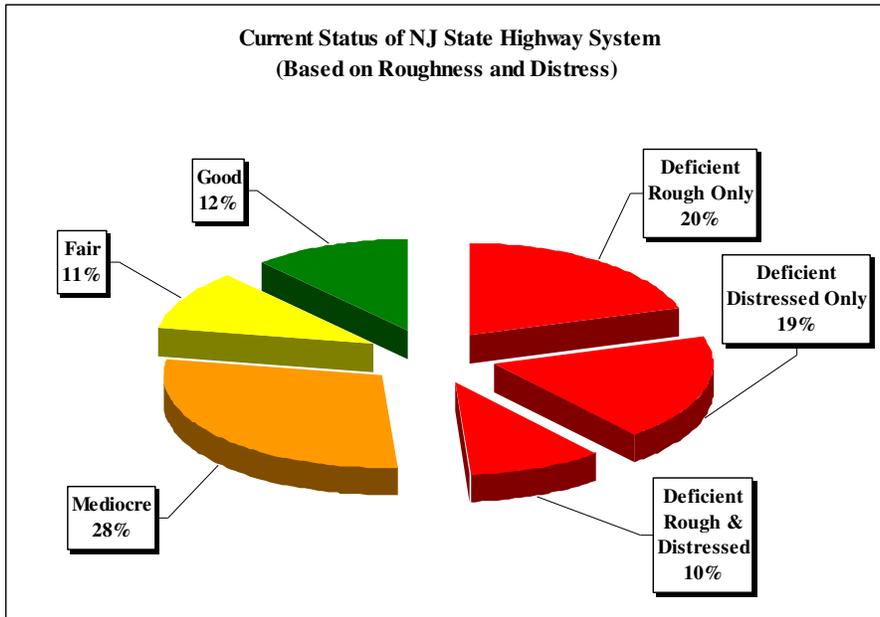
NJDOT also has programs to inspect and evaluate state and local culverts, many of which are, in effect, small bridges.

# Roadway preservation

## Condition of New Jersey's state highways

Pavement deterioration is a serious and growing problem on the 2300 centerline miles of New Jersey's state highway system. Increasing traffic loads, the natural aging process of highways, and limited funding for maintenance and resurfacing has led to various types of pavement distress—often visible to the motorist.

As shown in the chart to the right and table below, about 49% of the state highway system is deficient based on roughness and surface distress measurements. Based on a different testing methodology, it is estimated that 53% of the current state roadway system is structurally inadequate to sustain the current traffic loads.



The current status of pavement infrastructure on the state highway system demonstrates that accruing deterioration has created a significant backlog problem of structural and surface condition deficiencies.

**Current Functional Adequacy of NJ State Highway System  
(Based on Roughness and Distress)**

Condition	Road Miles (Two Directions)	Lane Miles (Two Directions)	% of Total System
Deficient by Roughness Alone	943	1673	20%
Deficient by Distress Alone	795	1544	19%
Deficient by Roughness & Distress	490	843	10%
<b>Total Deficient</b>	<b>2228</b>	<b>4060</b>	<b>49%</b>
Total Mediocre	1419	2404	29%
Total Fair	513	876	11%
Total Good	484	959	11%
<b>Total State System</b>	<b>4644</b>	<b>8299</b>	<b>100%</b>

Source: NJDOT Pavement Management System, 2004 Data

This problem has developed in spite of the fact that previous capital programs have addressed pavement deficiencies as much as possible, subject to available funding levels, project schedules, and the need to accommodate other competing needs. Although many segments of the state highway system will continue to be repaired or rehabilitated, the life-cycle of other segments are coming to an end. This significant level of deterioration will require a "mix of fixes" requiring short range and long range solutions. In order to slow down and reverse the accruing deterioration, increased funding levels will be required to shrink the backlog of pavement deficiencies.

# Roadway preservation

## Meeting the need

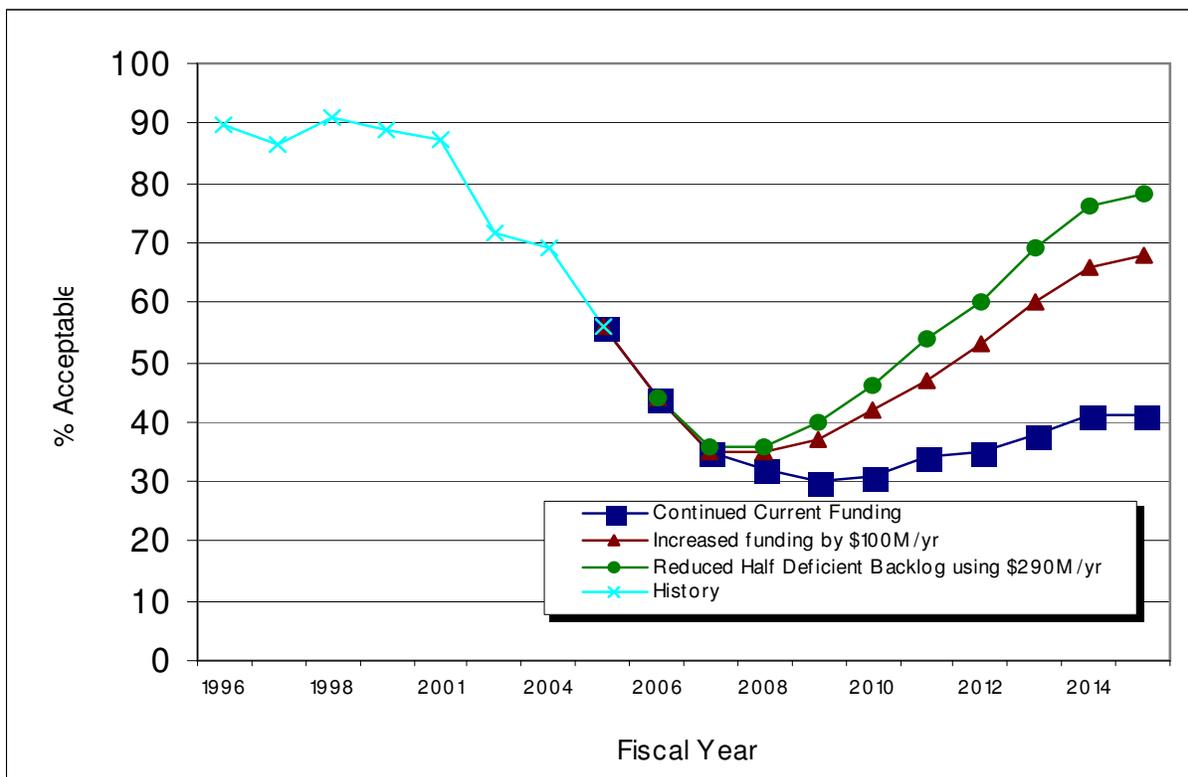
Maintaining the structural integrity and ride quality of the state highway system is a fundamental objective of NJDOT’s capital investment strategy. Advancing this objective, given current conditions, will require more significant investment in pavement. Within its overall “Fix It First” goal, NJDOT is committed to a long-term program to shrink the backlog of deficient highway segments and to identify and implement state-of-the-art engineering techniques and management practices. However, lack of adequate funding is the key constraint to pavement improvement.

The following investment scenarios were evaluated over a 10-year period:

- Scenario A: Funding reduced below current level
- Scenario B: Funding continued at current level
- Scenario C: Funding increased by \$100M/Yr over current level
- Scenario D: Funding required to reduce the deficient backlog by 50 percent (\$290M/Yr)

**Multi-Year Performance Analysis  
Percent of System Deficient Based on Roughness\***

*\*The figure below demonstrates trends over time based on roughness only. Total system deficiency based on all performance indicies would yield significantly greater percentages than those shown below.*



In order to evaluate pavement performance over time in response to different investment scenarios, a performance analysis was conducted using roughness parameters alone without considering surface distress or structural adequacy (total system deficiencies will be significantly greater). The results shown in the figure below were generated.

This performance analysis assumes that the funding amounts are applied to pavement priority projects. Often, roadway rehabilitation and reconstruction projects are large-scale projects that contain many activities (bridge rehabilitation, traffic signals, safety improvements, utilities, sidewalks and curbs, etc.) that do not directly improve the pavement network condition. Care must be taken in project selection to assure that an adequate percentage of existing lane miles are treated each year to achieve the desired performance level

Based on the investment scenario analysis, the capital investment strategy recommends increasing funding levels for highway resurfacing, highway capital maintenance and highway rehabilitation and reconstruction programs by approximately \$100 million per year. The FY07 Proposed Transportation Capital Program implements this recommendation.

The Pavement Preservation CIS is pursuing a more cost effective, practical approach to pavement management in New Jersey. Using a life cycle cost analysis, a strategy was developed that maps out a plan for implementing: "The Right Treatment, At the Right Time, At the Right Place, At the Right Cost." This course of action promotes the most efficient use of available funding based on timing, treatment selection, and priority locations. The ability to selectively fast track projects through a streamlined project development pipeline will play a significant role in implementing this investment strategy. The capability to optimize investments by reallocating, re-directing and increasing funding levels will optimistically have a greater impact on preserving New Jersey's pavement infrastructure.

# Roadway preservation

## Pavement management system

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NJDOT’s pavement management system (PMS) evaluates the condition of the pavement on the state highway system every year. State-of-the-art equipment collects surface distress, roughness, and rutting data, as well as GPS coordinates and high resolution digital images, all at highway travel speeds. Skid resistance data is also measured by a separate trailer-mounted instrument.

Currently, the primary performance measures for pavement condition are International Roughness Index (IRI) and Surface Distress Index (SDI). The former estimates roughness using lasers and an accel-

determine the structural response of over 800 miles of pavement at highway traffic speed. Because FWD is a static operation, only a few miles can be measured in a work shift whereas the RWD can collect up to 300 miles in a single work shift.

A new performance measure called Remaining Service Life (RSL) is currently under development. Use of RSL, supported by the Federal Highway Administration, will support a proactive pavement preservation approach which should reduce the need for costly rehabilitation and reconstruction projects.



erometer to determine variations in the pavement surface from a flat plane, and the latter assesses surface condition in terms of cracking, patching, raveling, shoulders, joint deterioration, etc. The rut and skid data are used for highway safety programs. In addition, structural condition is evaluated with the Falling Weight Deflectometer (FWD), which simulates pavement response to heavy truck loading. While the FWD requires lane closures and interference with traffic, the Rolling Wheel Deflectometer (RWD) was utilized this year to

The Pavement Management System is used by NJDOT to support budget analyses (as shown in this report) which show the outcomes of different funding levels as well as suggest the optimum mix of different types of pavement treatment (rehabilitation, resurfacing, preventive maintenance, etc.). The PMS is also used to identify new projects and to prioritize projects already in the capital program.

A description of the current criteria used to evaluate the system is shown in the following table:

### Criteria Used to Assess Roadway Condition

Condition Status	IRI (International Roughness Index, in/mi)	SDI (Surface Distress Index)	Engineering Significance
<b>Deficient (Poor)</b>	<b>Above 170</b>	<b>0 - 2.5</b>	<b>These roads are overdue for treatment.</b> Drivers on these roads are likely to notice that they are driving on a rough surface, which puts stress on their vehicles. These pavements may have deteriorated to such an extent that they affect the speed of free flow traffic. Flexible pavements may have large potholes and deep cracks. These roads often show significant signs of wear and deterioration, and may have significant distress in the underlying foundation. Roads in this condition will generally be most costly to rehabilitate.
<b>Mediocre</b>	<b>120 - 170</b>	<b>2.6 - 3.0</b>	<b>These roads exhibit minimally acceptable ride quality</b> that is noticeably inferior to those of new pavements and may be barely tolerable for high-speed traffic. These pavements may show some signs of deterioration such as rutting, map cracking and extensive patching. Most importantly, roads in this category are in jeopardy and should immediately be programmed for some cost-effective treatment that will restore them to a good condition and avoid costly rehabilitation in the near future.
<b>Fair</b>	<b>95 - 119</b>	<b>3.1 - 3.4</b>	
<b>Good</b>	<b>0 - 94</b>	<b>3.5 - 5.0</b>	<b>These roads exhibit good ride quality</b> with little or no signs of deterioration. A proactive preventive maintenance strategy is necessary to keep roads in this category as long as possible.

# Roadway preservation

## Drainage

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Some segments of New Jersey’s state highway system are subject to chronic flooding as a result of the aging of existing drainage systems, inadequate resources to maintain them, and increased (and sometimes



poorly planned) development along state highways. This in turn means that key elements of the state transportation system are periodically failing to perform—often at times when they are needed the most.

NJDOT uses a Drainage Management System (DMS) to identify, categorize and prioritize flood sites in a consistent and equitable manner. The evaluation criteria rank the drainage projects by weighing the cost and severity of the existing flood condition against the cost of the flooding problem solution identified. There are a total of seven factors used in the ranking system:

Safety - Estimated cost of safety hazards encountered at each site during a flood, event in thousands of dollars.

Structures - Estimated cost of flood impact on the number of homes and businesses affected by the flood, in thousands of dollars.

Emergency - Estimated cost of impact upon the number of emergency facilities located on routes affected by a flood event, in thousands of dollars.

Traffic - Time plus running cost losses computed for each site, in thousands of dol-

lars per year.

Environmental - Anticipated cost of environmental concerns based on the estimated number of environmental permits that are required for the proposed solution, in thousands of dollars.

Solution - Estimated cost of the proposed solution at each site, in thousands of dollars.

Frequency - Average number of flood events per year.

DMS analysis also recommends a proposed solution. This may lead to a full-scale project moving through NJDOT’s project development system or to a “cleanout” of the drainage system using one of the drainage rehabilitation and maintenance programs.

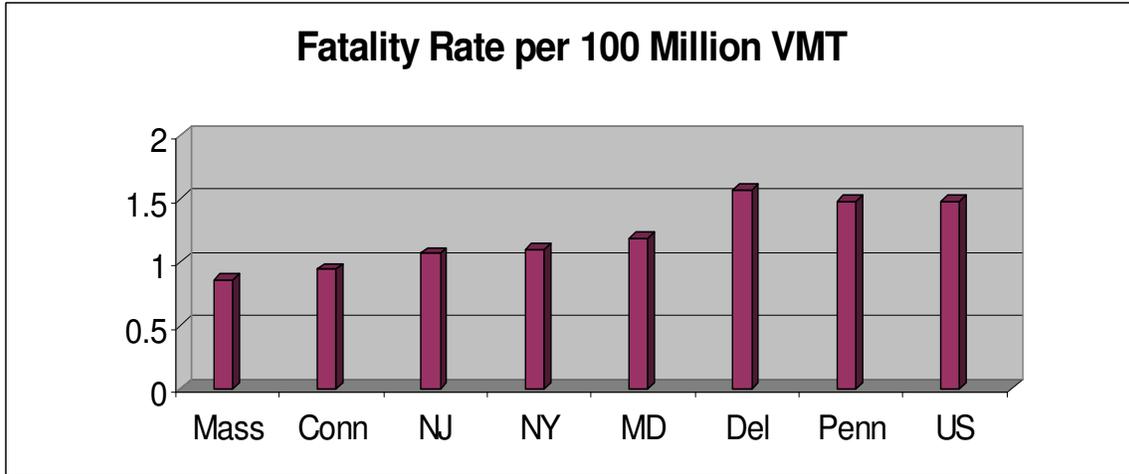
About 60 sites are currently identified for work in NJDOT’s capital program or study and development program. About 100 more sites are being reviewed for possible future action. At a funding level of about \$20 million per year, it is estimated that we will reduce the total backlog of identified drainage needs by one-half over the next 10 years. The capital investment strategy recommends that we continue to invest in drainage improvement projects at this funding level, or more, over the next ten years. The ability to maintain this investment level is necessary to achieve the goal of eliminating the backlog of serious flood sites on state highways over the next decade. In order to implement this strategy, the drainage management system will serve as the tool to identify and prioritize flooding problems and provide data for recommendations to mitigate flooding conditions.

# Safety

## How safe are our highways?

With so many motor vehicles traveling New Jersey's interstate freeways, toll roads, and state highways each day, vehicular crashes on our roads are not uncommon sights. However, over the last five years the total number of vehicular crashes in New Jersey declined by about 4%. Although New Jersey is the most densely populated state in the nation, with approximately 36,000

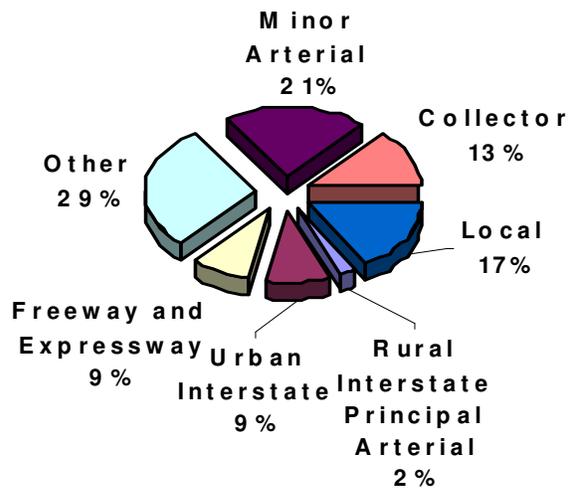
Jersey roadways, there were 731 fatal crashes, which also resulted in 155 pedestrian fatalities. The chart below shows a breakdown of total fatal crashes by roadway type. There were also 75,851 crashes involving injuries. In addition, economic losses as a result of motor vehicle traffic crashes in New Jersey were estimated at \$9.3 billion.



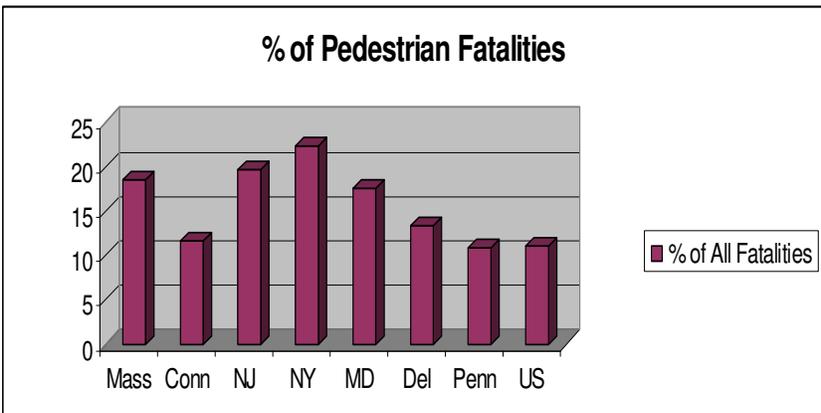
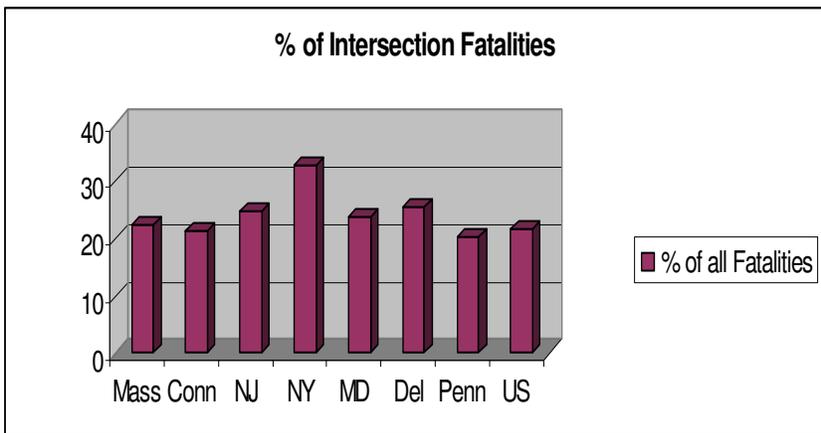
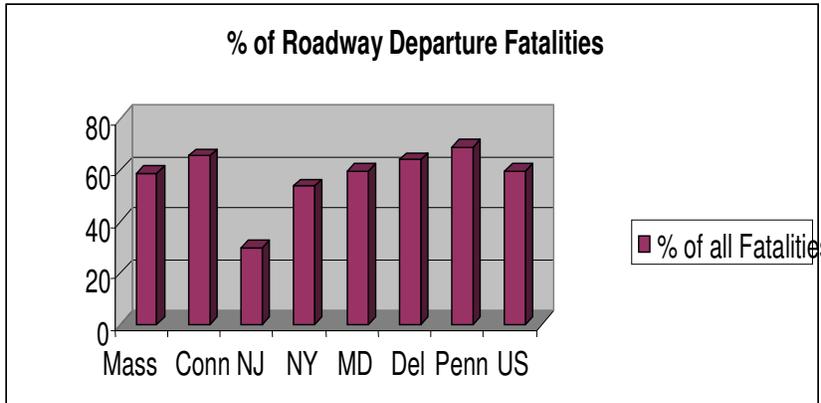
miles of roadway that attracts many interstate travelers from New York and Pennsylvania, fatality and injury crash rates have also decreased over the past several years.

This declining yet favorable trend is the result of many factors, including safer driving behavior, safer cars, more seatbelt usage, less drunk driving and safer roadways. Compared with other states in the Northeast, New Jersey has one of the lowest fatality rates.

While New Jersey's crash rate statistics have improved, tragically there are still many serious crashes that result in deaths, severe injuries, and unrecoverable economic losses. In 2004, of the approximately 320,000 crashes reported on New



The following charts show how New Jersey compares against other northeastern states with regard to some fatality indicators:



# Safety

## Safety First

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NJDOT is continuing to pursue its Safety First program as a top priority. Safety First began in 2003 with the convening of the Governor's Highway Safety Task Force, which included representatives from NJDOT, the State Police, other state agencies, and a variety of public and private groups interested in promoting roadway safety. The program addresses the "4 Es" of the highway safety problem: Engineering (making roads safer), Education (encouraging better driving habits), Enforcement (stopping unsafe and illegal driving) and Emergency Medical Services.

NJDOT initiatives launched as part of the Safety First program include:

- Median crossover crash prevention program—Installation of guiderail or cable along grass highway medians to prevent out-of-control vehicles from crashing head-on into opposing traffic.
- Safe corridors program—Implementation of improvements recommended by safety impact teams within designated safe corridors, including doubling fines in high risk areas.
- Safe streets to school program—Support for municipal projects to improve sidewalks and street crossings to provide safer access to schools for walking students.
- Adoption of technologies to improve emergency response times for crashes.
- Increased penalties for commercial vehicle violations.
- Revision of the written driver's test.



NJDOT is continuing to work with more than 20 agencies and organizations in the state's Safety Management Task Force to develop a Comprehensive Safety Plan for the future. The task force has already developed draft Vision, Mission, and Goal statements:

Vision – We will strive to operate the safest surface transportation system that will ensure the health and well-being of all users.

Mission – To develop, promote, and implement education, enforcement, and engineering strategies for reducing the frequency and severity of vehicle and pedestrian crashes on New Jersey's transportation system.

Goal – Continually reduce the total number of crashes, emphasizing a reduction in the deaths and injuries, on New Jersey's transportation system.

The task force is now in the process of identifying emphasis areas for future efforts. The Eight Emphasis Areas are:

- Curb Aggressive Driving
- Improve Design/Operations of Intersections
- Increase Driver Safety Awareness
- Minimize Roadway Departure Crashes
- Reduce Crashes With Young Drivers
- Reduce Impaired Driving
- Reduce Pedestrian, Bicycle, Rail & Vehicular Conflicts
- Sustain Proficiency in Older Drivers

# Safety

## Safety programs

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Safety First is implemented in several NJDOT supported projects that utilize the 4E's (Engineering, Education, Enforcement, and Emergency Medical Services) and other measures to enhance safety and reduce crashes.

The safe corridors and safety intersection improvements programs are discussed in detail on other pages. Some of the other key programs include:

### Statewide Engineering Programs

**Statewide Median Cross Over Barrier Program:** Installation of barriers along interstate highway medians to prevent collisions between vehicles traveling in opposite directions. Several highways with high vehicle and truck volumes (I-78, I-80, and I-287) were targeted for early installation. A goal of 25 miles of installation has been set for FY07.

**Raised Pavement Markers:** Over 500 miles of raised pavement reflectors are being installed to improve visibility on 100 miles of roadways in North Jersey, 112 miles in Central Jersey, and 29 miles of roadways in South Jersey.

**Retro-reflective Striping Tape:** All construction projects will include the requirement to use retro-reflective striping tape on every highway construction site in New Jersey in order to enhance safety and improve visibility during construction.

**Expansion of Emergency Service Patrols (ESP) to Enhance Incident Management:** NJDOT will use a network

of cameras to identify incidents and deploy emergency services to alert motorists of changes in driving patterns.

**Deer Program:** Deer removal contractors have been working with the NJDOT to plot the location of deer/vehicle collisions using GIS palm pilot devices. This has enabled the department to further identify "hot spots" and offer solutions to address these conditions, which include increased highway lighting, installation of appropriate fencing, etc.

**Local Aid Safety Program:** Funding has been allocated by NJDOT for local "quick fix" projects. This program is an integral part of the Safety Conscious Planning (SCP) program where criteria and protocols have been developed and linked to each of the Metropolitan Planning Organizations (MPOs) and incorporated into their SCP programs.

**Wet Surface Program:** Data tables and GIS mapping show pavement SKID data and wet weather crash data. The ARAN and SKID field inventory data are being compiled and incorporated into the NJDOT database for analysis and use in research studies.

**Safety Projects:** Several specialized safety engineering projects are sponsored by NJDOT that are designed to improve conditions of state roadways. They are primarily focused on crash reduction and prevention efforts for intersections, pedestrian crash reductions, right angle crash reductions, signalization programs, left turn crash reduction, median cross-over crash prevention, and safe corridor projects.

**Senior Safety Task Force:** The task force features representatives from the County, AAA, AARP, DOT, DHSS, and MVC. A Safety Impact Team (SIT) conducts an on-site Audit and the results are presented to the public at health and wellness fairs. The focus of this group is to provide safety enhancements to improve senior mobility.

## Statewide Educational Programs

**Enhance Safety Materials on the Written Drivers Test and Manual:** New drivers are now being educated on proper car-truck interaction, blind spot recognition, and safe stopping distances to ensure sharing the road safely. Eight new questions have been added to the written Drivers Test that deals with safe car-truck interaction.

**Classroom Instruction on Safe Car-Truck Interaction:** With the cooperation of the New Jersey Department of Education, all classroom instructors will be required to incorporate the importance of safe car-truck interaction into their programs.

**Truck Drivers Training:** Remedial safety programs have been developed for truck drivers with mandatory sessions required for Commercial Drivers' License (CDL) holders who have accumulated 12 or more points on their records.

**Operation Safety Net:** NJDOT has partnered with the Federal Motor Carrier Safety Administration on a program for new motor carriers to undergo extensive training, audits, and continued education in compliance with state regulations. Since the inception of this program, several thousand truckers have registered for the training and safety audits.

**Safety Conscious Planning Program:** In 2003, a committee of several state and metropolitan planning representatives met to schedule the statewide 2004 Safety

Conscious Planning Forum to further identify how safety can be incorporated by the MPOs into all stages of the planning process. During the past year, three regional forums were co-sponsored by FHWA-NJ Division, NJDOT, NJDHTS, NJSP, Rutgers University CAIT-LTAP, Delaware Valley Regional Planning Commission (DVRPC), North Jersey Transportation Planning Authority (NJTPA), and the South Jersey Transportation Planning Organization (SJTPO). A statewide Transportation Safety Seminar has been scheduled to provide background on available safety resources for municipal agencies. This program is being targeted for municipal officials, planners, and engineers with the intent of promoting Safety Conscious Planning (SCP) locally, where over 50% of the roadway fatalities occur.

**Lead State Aggressive Driving Campaign:** An Aggressive Driving Strategic Plan has been developed with support from the MVC, NJSP, municipal police departments, County Prosecutors' Office, and FHWA - NJ Division. The plan was submitted to the AASHTO Lead State group for review and acceptance.

## Statewide Enforcement Programs

**Inspections at Every Truck Point Entry into New Jersey:** An initiative has begun to improve safety by inspecting trucks for compliance with safe weights, equipment, and driving records of the operators. Within the next few years, a permanent or mobile truck inspection station will be available at entry points into the state. Electronic credential screening technology will become available for digital review of truck safety credentials. Also, NJDOT will work with the NJSP to increase the performance of comprehensive safety inspections throughout the state.

**State Police Enhanced Enforcement at Strategic Locations and Along Safe Corridors.** NJDOT and NJSP are tracking re-

sults of increased police enforcement in designated areas. Data collected from issued warnings and summonses will be analyzed for this effort.

In the future, NJDOT's safety program categories will be revised to better align the capital program with the New Jersey Comprehensive Highway Safety Plan emphasis areas.

It is important to note that almost all projects advanced by NJDOT to improve the state highway system are designed to improve the safety of the traveling public in one way or another.

The programs discussed here are "targeted" safety programs which address specific safety concerns.

In order to advance our safety goals, NJDOT is proposing to increase funding for these targeted programs by approximately 50% in the coming five-year plan, from about \$50 million a year to about \$75 million a year.

# Safety

## Safety corridors

At the recommendation of the New Jersey Highway Safety Task Force, the Legislature enacted a "Safe Corridors" act (NJSA 39:4-203.5) in 2003 that increases fines for traffic violations on crash-prone highway segments. Under the act, a "safe corridor" is defined as a segment of highway under NJDOT jurisdiction that is identified by the Commissioner as warranting that designation based on accident rates, fatalities, traffic volume, and other highway safety criteria.

The purpose of the safe corridor program is to significantly reduce the frequency and severity of overall crashes and specific crash types on these highways. Fines for certain traffic violations are doubled within the designated corridors, and NJDOT has developed a methodology to reduce the number and severity of crashes through a variety of engineering, educational, and enforcement practices. Special "safety impact teams" analyze crash data and problem areas and make recommendations for safety counter-measures using a variety of programs.

Safe corridor locations are identified and ranked according to an analysis of various factors, including total crashes, crash rates, fatalities, injury crashes, and property damage. The final list of 13 locations designated under the act met a minimum of 1,000 crashes over 3 years and a crash rate 50 percent higher than the statewide average. These locations total 129 miles along Routes 1, 9, 40, 46, 47, 73 and 206.



# Safety

## Safety intersection improvements

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The safety intersection improvement program is aimed at reducing the frequency and severity of overall crashes and specific crash types occurring at intersections.

### Route 130 and Route 47 (Brooklawn Circle)



Intersection locations are identified and ranked according to a calculated "severity index" based on crash data. All potential project locations are also screened for over-represented crash types as compared to the statewide averages for similar locations. NJDOT safety investigators use all of this information to analyze intersections and recommend countermeasures. In many cases, improvements to signs, striping and traffic signals can reduce the occurrence of crashes. In other cases, more extensive improvements, such as redesigning intersections to add protected turning lanes, may be necessary.

Examples of intersections improved under this program include:

### Route 1&9 and East Jersey Street:

This location had been experiencing

a high number of overall crashes, ranking it 7<sup>th</sup> on the overall Intersection Improvement Program (IIP) list, but it was more infamous for its frequency of Pedestrian crashes—leading to its #1 ranking on the pedestrian program list. The intersection experienced 12 pedestrian crashes from 1993 to 1995 and from 1998 to 2003; one of those was fatal. Other problems that were identified included same direction crash patterns and right angle crashes. Upgrades included the installation of left turn lead phases, larger/additional vehicular signal heads, pedestrian signals and more positive lane use signing and striping. The interim improvement project reduced overall, targeted and injury crashes and percentages. Future improvements will be incorporated into another project.

### Route 27 and Route 439 :

This intersection was also represented on both the Pedestrian and overall IIP lists. Between 1998 and 2000, there were four pedestrian crashes and 77 vehicular crashes at, or in the immediate vicinity of, this intersection. In early 2001, a timing change was made to add all-red intervals following each of the two phases. Based on a comparison of crash data for the three years (2001-2003) following this minor modification, it appears that this relatively simple adjustment may have yielded a 16.5% drop in total crashes. The next stage of intersection upgrades included the revision of all four approaches from two lanes (thru/left, thru/right) each to the more desirable geometry of

head-to-head left turn lanes adjacent to curbside through/right lanes. This was accomplished as part of the Road Diet project for Route 439.

While the initial after period statistics show significant improvement as a result of the initial two stages of low-cost treatment at this intersection, NJDOT still intends to revise the signal layout to include larger signal heads, pedestrian countdown signals, presence detection on Route 439 or possibly all four approaches for fully-actuated operation, and an improved far-side location of the Route 27 signal heads (directly across from the approach). These future modifications should ensure a much safer intersection from both a vehicular and pedestrian safety standpoint.

#### **Route 130 and Route 47 (Brooklawn Circle)**

This location had been experiencing a high number of overall crashes due to the lack of any positive control of the various legs of the Circle. In addition, there was clearly an excessive frequency of fixed object-struck curb crashes at the Route 130 southbound entrance to the Circle, a problem especially exacerbated by inclement road surface conditions.

Interim improvements included installation of a scheme of Yield signs and markings at the various previously uncontrolled intersection points and also some measures to "calm" the Route 130 southbound traffic prior to its arrival to the Circle to reduce the run-off road/fixed object hits at the entry. The 18-month before/after study revealed reductions in overall crashes (14.7%), injury crashes (30.1%), same direction (12.1%) and especially the primarily targeted Route 130 southbound fixed object crashes (38.5%). Longer-term improvements are being planned.

# Safety

## Safety management system

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The Safety Management System identifies high-crash locations and patterns of crashes (right angle, left turn, wet weather, same direction, deer/animal, etc.). Based on these analyses, NJDOT, in cooperation with the Federal Highway Administration, develops a Highway Safety Improvement Program, which targets funding for those projects and programs likely to produce the best results in reducing the number and severity of crashes.

To track the long-term progress toward achieving the stated goal, NJDOT is proposing the use of the following performance indicators.

### **PERFORMANCE INDICATORS:**

**Total Number of Crashes**  
**Number of Deaths**  
**Number of Injuries**

The performance indicators can be obtained from available data within New Jersey's Crash Records System. A primary data source for the evaluation of fatalities is the National Highway Traffic Safety Administration's (NHTSA) Fatal Accident Reporting System (FARS).

NJDOT plans to adopt a subset of goals and performance indicators for each program category to measure and track the progress of the investments made through the capital program. In essence, the Long Range Plan and Capital Investment Strategy will track those things that are impacted by the programs implemented as part of the capital program. It is anticipated that each program category will consist of multi-year performance indicators (number of crashes, deaths, injuries, etc.)

that reflect back to the overall goal statement. These performance indicators will be tracked over time to determine how well the implemented programs actually contributed to the overall goal. In the interim, annual performance indicators, including the number of projects implemented and funding spent within each program category, will be tracked to determine progress and perform cost-benefit analyses of the programs.

The Safety Management System will also continue to be used to evaluate other NJDOT projects and problem statements to determine their effectiveness in advancing our safety goals. Projects with potential high benefits in this regard will receive increased priority and will be eligible for federal safety funding.

The Safety Management System is currently being enhanced by the following efforts:

- a. Revisions to the crash form to provide better location information of crashes and the specifics of the crash (January '06);
- b. Revisions to the Crash Records Database to reduce input errors; increase efficiency of crash data verification; development of decision support tools; and development of crash analysis tools for counties and municipalities to develop safety management systems; and
- c. Partnering with several local police agencies and the NJ State Police to test electronic transfer of crash reports (February '06).

# Homeland security

## Protecting our transportation system

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Since 9/11, all of us have become more aware of the threat of terrorist acts on American soil. New Jersey's transportation system continues to be a soft target for these threats. NJDOT recognizes that part of its core mission is to ensure the protection of its transportation system and that vulnerability and risks are reduced through target hardening measures, the procurement of interoperable voice/data communication equipment, intelligence information sharing, equipment, training, exercises, and the oversight and implementation of best management practices for each transportation sub-sector. NJDOT has established an Office of Transportation Security to coordinate all state efforts for transportation security with an "all hazards" approach. This coordination includes a phased implementation of transportation security initiatives for all critical infrastructure and modes of transportation. The office coordinates regional transportation security planning efforts, project implementation, project financing and operations. To accomplish these objectives, the office is working with other NJDOT staff, other agencies (including other state agencies, the Port Authority of New York and New Jersey, and NJ TRANSIT), private sector aviation, ferry companies, port operators, passenger railroads, freight companies, highways, bridges, and tunnels, academic institutions, and communities to develop and implement a statewide transportation security plan. The office also coordinates with all federal agencies having responsibility for homeland and transportation security. NJDOT has programmed "startup" funding for various proposed programs at this time. As the statewide plan is developed, additional investment needs will be identified and security funding will be allo-

cated in a way that focuses on improving our ability to prepare, prevent, respond to, and recover from a terrorist attack.

# Congestion, mobility, accessibility

## Congestion in New Jersey

New Jersey's transportation system provides mobility, supports and generates economic development, and enhances the quality of life for the residents of this State and the region. Ensuring the viability of this system is critical for the health of the State's economy and the quality of life for all New Jerseyans.

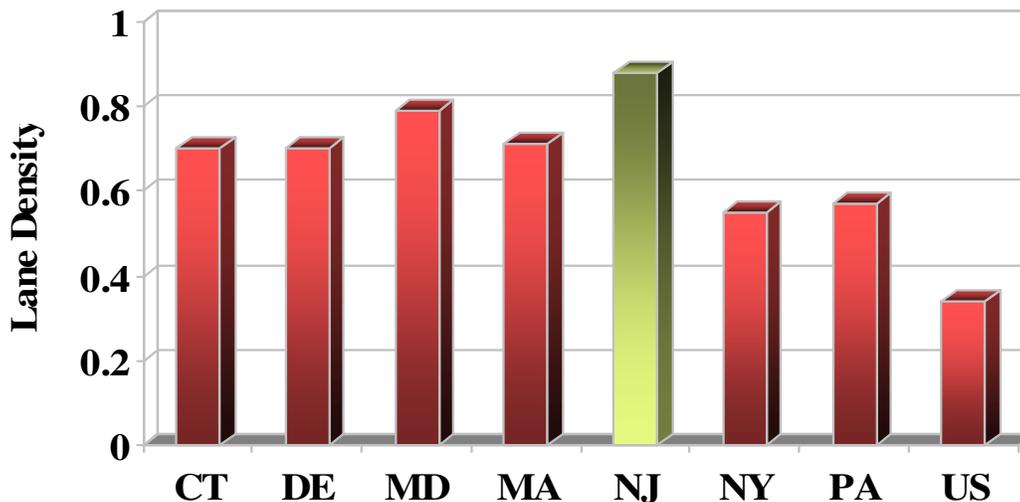
However, significant congestion and delay occur on New Jersey's highway system each and every day, resulting in increased driver stress, reduced quality of life, wasted fuel, increased air pollution and decreased productivity. In fact, New Jersey has the most densely traveled roads in the Northeast, and drivers experience over a million hours of delay every day. These costs are staggering: congestion and delay

impacts translate to over \$8 billion annually and continue to climb.

Congestion is a product of population growth, economic growth, and sprawl development. Based on present trends, congestion will continue to grow. NJDOT's congestion management system estimates that between 2001 and 2015 total traffic (measured in vehicle miles traveled) will grow by 18 percent on New Jersey's interstate highways and freeways and by 15 percent on other major roads.

How does traffic congestion in New Jersey compare with the rest of the country? Data compiled by the Texas Transportation Institute show that among the largest metropolitan areas in the country, northeast

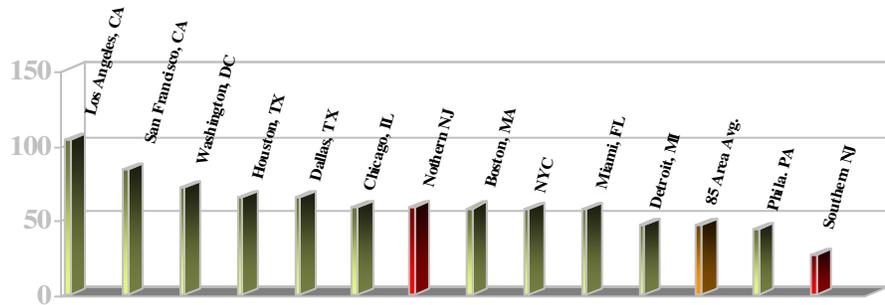
**Year 2002 VMT/Lane-Miles**  
**Millions of Vehicle Miles per Lane Mile per Year**  
**(Lane Density)**



Source: FHWA

New Jersey ranks 7th—about the same as Chicago and Boston. The south Jersey portion of the Philadelphia region does better, ranking 44th—similar to smaller urban areas such as Stamford, Connecticut and Raleigh-Durham, North Carolina.

### Annual Hours of Delay per Traveler for Very Large Urban Areas (Year 2002)



Source: Texas Transportation Institute

# Congestion, mobility, accessibility

## Fighting congestion

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How can we fight congestion? Or, to look at the problem another way, how can we improve the mobility of our citizens and the accessibility of the places that want to go to? There are several things we can do:

- Build more highways—This was once considered the best tool for addressing congestion, but it is often not a very practical (or even very effective) solution in today’s New Jersey.
- Build more transit—This is a better solution in many ways and will be discussed in the NJ TRANSIT portion of this report.
- Coordinate land use development and transportation—This is also a better solution and one in which New Jersey has taken a leadership role in the nation.
- Fix bottlenecks on the highway network—This an answer that NJDOT continues to pursue vigorously.
- Use technology to better manage the system—We are still at the early stages of seeing the benefits of this approach.
- Promote walking and bicycling—Providing options for walking and bicycling not only fights congestion, but it also promotes healthier individuals and healthier communities.

Each of these alternatives will be dealt with in more detail in this report.

There are a number of smaller programmatic approaches which also offer benefits:

- Congestion Management System—First and foremost, the NJDOT’s Congestion Management System (NJCMS) is an essential front-line tool in fighting congestion. The NJCMS is designed to identify congested roads and hotspots and ar-

eas with high levels of recurring and non-recurring delay. Through system performance measures and cost impacts, it can help to formulate a comprehensive approach to congestion. For example, “the tool” was recently used to identify 19 roadway corridors that are prime candidates for ITS and Emergency Service Patrol (ESP) treatments. And through its Statewide Intersection Analysis Process (or SIAP) protocol, the NJCMS has located 708 “high need” signalized intersections on the State system—potential candidates for the Department’s “Quick Fix” program. Through these and other critical functions—such as project pool and program ranking, Tier II screening, and MPO support—the NJCMS allows us to achieve a more targeted, fiscally responsible program of Congestion Relief.

- Park and ride—NJDOT is investing about \$9.5 million per year, in addition to NJ TRANSIT’s program, to support existing and new park and ride locations. This program also implements other transportation demand management strategies, including commuter ridesharing assistance, marketing of alternatives to single-occupant vehicle use, and statewide voluntary employer programs. Funding will need to be increased as more park and ride locations are identified.
- Transportation management associations—Transportation management associations (TMAs) are locally run organizations that organize, support, and market a wide array of ridesharing and transit alternatives in their regions. NJDOT currently supports these organizations at a level of about \$5.3 million per year, although more has been requested.

- Emergency service patrols and incident response—About half of the total delay experienced by highway users is caused by incidents such as crashes and vehicle breakdowns. The Emergency Service Patrol program was launched in 1994 to help keep the highway lanes clear, reduce congestion, and increase safety for all motorists. ESP crews currently assist more than 67,000 motorists a year. The program covers almost 390 miles of interstate highways and freeways, with service from 4:00 a.m. to 8:30 p.m., Monday through Friday, and on a majority of holidays and summer weekends. Incident Management Response Teams work with the State Police to respond to major incidents.
- Signs—Traffic signs help motorists navigate the highway system. Good signage reduces delay by helping motorists move efficiently through the system. Bad signage causes confusion and can add unnecessary miles to a trip. NJDOT has embarked on a comprehensive program to review and upgrade its highway signs. The use of dynamic message signs provides the motorist with real time traffic information to make better decisions at any given time. Although not yet an expensive program, additional funds will be necessary in the future.
- Traffic signal timing—Modern traffic signals can be programmed to operate in different patterns at different times of day or in different traffic patterns. NJDOT has begun a modest program of using contractor support to speed up the retiming of traffic signals on arterial highways to accommodate changing traffic patterns.
- Access management—NJDOT has a responsibility to manage access to state highways under the State Highway Access Management Act. A small amount of capital funding is set aside to support this effort. NJDOT has also begun a comprehensive review of its regulations to determine how they might be updated to fit current ideas of improved land use planning (Smart Growth).

# Congestion, mobility, accessibility

## Major capacity increases

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NJDOT policy continues to limit funding for major highway capacity increases to no more than 4% of the total capital program. This policy is the result of (1) the need to give priority for funding to projects aimed at restoring our system to a state of good repair, (2) an appreciation of the financial, environmental, and community costs of many possible capacity increase projects, and (3) an understanding that other tools are more appropriate and often more effective in fighting congestion.

How does New Jersey's policy and practice differ from what is happening in other states?

- The Texas Department of Transportation is undertaking the largest engineering project ever proposed for Texas in its Trans Texas Corridor. The corridor would consist of a 4,000-mile network throughout the state of highway, rail and utility corridors up to 1,200 feet wide. The highway element of the project would add five travel lanes in each direction. Cost estimates for the Trans Texas Corridor range from \$145 billion to \$183 billion.
- In January 2006, the Maryland DOT released its selection of a preferred alignment for the 18-mile Intercounty Connector. This project will build a new six-lane freeway to link areas of existing and proposed development between I-270 and I-95/US 1 in Montgomery and Prince George's Counties—suburbs of Washington, DC. The Intercounty Connector is expected to cost \$2.4 billion and is now proceeding after decades of opposition.
- In Atlanta, the Georgia Department of Transportation has proposed the addition of four lanes in each direction

along a 15-mile stretch of I-75 to address severe congestion—bringing the total number of lanes to 23. This alternative would require nearly 200 acres of right of way.

- Construction of a new \$1.2 billion, 47-mile toll highway that circles the eastern side of the Denver metropolitan area has recently been completed. The publicly owned and operated beltway, E-470, was built to stimulate residential and commercial development and improve mobility.

Major capacity increases of this magnitude are not New Jersey's answer to the congestion problem. Relying on new highway construction does not promote the development of a sustainable transportation system with improved mobility and accessibility and the quality of life that the residents of New Jersey desire.

Highway capacity increases (defined for this purpose as the construction of new through lanes, either through new highway construction or the widening of an existing highway) **do** make sense as a tool in some settings. NJDOT will continue to build new lanes in locations where this tool seems the most appropriate and where any negative land use consequences are controlled. In fact, in some cases new roadway construction is actually a key element of "Smart Growth" development. For example, within certain regionally strategic and significant corridors, all strategies—including added capacity—should be considered. Additional or widened lanes may be necessary on a selected basis, to achieve true mobility, accessibility and economic vitality. In particular, construction of smaller roads and streets to fill in circulation "grids" can have very beneficial land use effects.

# Congestion, mobility, accessibility

## Relieving bottlenecks - highway operational improvements

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One effective way to fight traffic congestion is to address the constraints, or “bottleneck” effect, of intersections and interchanges that permeate the State’s transportation system. Old, outdated, or substandard geometries, coupled with continually increasing traffic, have overwhelmed many of these locations. More specifically, these pinchpoints often have competing traffic movements at intersections, inadequate ramps at freeway interchanges, and outdated traffic patterns created by the now sub-standard design of traffic circles. NJDOT classifies as “highway operational improvements” those projects which provide relief to these bottleneck locations. Highway operational improvements include:

- Redesign of freeway interchanges to facilitate movements from one road to another.
- Replacement of older traffic circles with safer, more efficient arrangements.
- Reconstruction of at-grade intersections, usually including separating turning movements and through movements.
- Low-cost, quick-turnaround intersection improvements funded under the Congestion Relief (Fast Move) program.

In 2003, the Blue Ribbon Commission report estimated that an investment of about \$110 million a year over the next 10 years would complete all the planned major projects and a significant number of smaller projects. In recent years, as other congestion relief programs have been constrained, NJDOT as actually invested about \$200 million a year in this cost-effective program. The capital investment strategy recom-

mends that this level of funding be continued.

NJDOT is currently advancing a total of 125 highway operational improvement projects in the capital program or the study and development program. A prioritization method is used to rank these projects, giving them numerical scores based on the congestion management system, the safety management system, and the State Development and Redevelopment Plan (SDRP). The congestion management system criteria and weighting that are used in this analysis are:

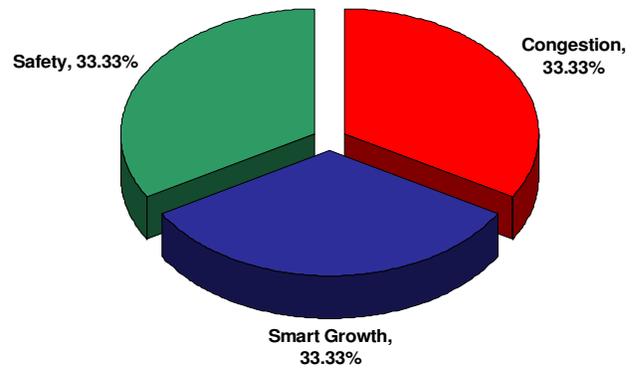
- Degree of Problem (40%)  
highest volume-to-capacity (V/C) ratio
- Magnitude of Problem (20%):  
highest average daily traffic (ADT) volume
- Importance of Problem (20%):  
highest facility type
- Geographic Location or “Equity” (20%):  
credit for Cost of Congestion, Travel Rate Index and Roadway Congestion Index

Together, these congestion factors, along with the safety and SDRP criteria, each represent 33 percent of the overall composite score.

An investment scenario analysis was conducted using the Congestion Management System to determine the most efficient funding allocation plan for this congestion relief program. Given the current projects in the pipeline, the analysis concluded that previous funding levels should be continued at about a \$200 million level over the next several years in order to complete the highest priority congestion relief projects.

However, in addition, more efficiency should be sought to obtain a higher return on investment by "rightsizing" as many larger scale projects as possible. As a result, these projects will be cheaper and quicker to build, and less intrusive on communities and the environment. In some cases, projects have grown in magnitude and cost beyond the original purpose and need of the project...we can no longer afford to do business in this manner.

## Highway Operational Improvements



# Congestion, mobility, accessibility

## Bicycle and pedestrian programs

Academic studies – and common sense – tell us that people who walk or ride bicycles frequently are healthier than those who do not. Children who walk or bike to school are much less likely to suffer from obesity and other problems. Communities where people walk and bike as part of their daily lives are vibrant, healthy communities. Walking and biking also provide people with an alternative to motorized travel—helping to relieve traffic congestion and improve air quality.



NJDOT is committed to improving pedestrian and bicycle opportunities as part of its core mission. The Statewide Bicycle and Pedestrian Master Plan has established a vision for the future:

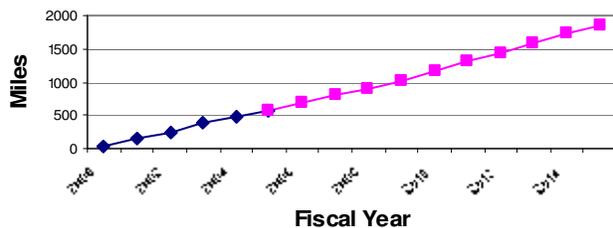
- New Jersey is a state where people **choose** to walk and bicycle.
- Residents and visitors are able to **conveniently** walk and bicycle with confidence and a sense of **security** in every community.
- Both activities are a routine part of the transportation and recreation systems and support **active, healthy** lifestyles.

The Master Plan also adopts 5 goals: Build the infrastructure; Improve access; Update policies, ordinances, and procedures; Educate and enforce; and Foster a pro-

bicycling and walking ethic.

NJDOT currently invests about \$20 million per year in bicycle and pedestrian programs. Most of these funds advance the Master Plan goal of building the infrastructure needed to support biking and walking. Investments since 2000 have produced an average of about 97 miles per year of bike paths in New Jersey. As a result, slightly over 580 bike path miles will have been completed through 2005. By 2010 it is anticipated that an additional 580 miles will be constructed—achieving 160 miles over the goal of 1,000 bike path-miles. At current investment levels, the total number of bike path-miles is expected to reach over 1800 miles by 2015.

**Bike Path Mileage**  
Actual and Projected



The Statewide Bicycle and Pedestrian Master Plan, and much more information about biking and walking in New Jersey, can be found at <http://njcommuter.com>.

# Congestion, mobility, accessibility

## NJFIT—Future in Transportation

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In the past few years, NJDOT has vigorously pursued a better linkage between land use planning and transportation planning. Better planned communities reduce traffic congestion while providing a better quality of life for their residents. “Sprawl” development is not necessary or inevitable. It is also not economically efficient. NJDOT is pioneering new ways of working with communities to learn from the mistakes of the past and to plan better for the future. The name given to this broad initiative is “NJFIT: Future in Transportation.”

The NJFIT philosophy features three principal subject areas:

- *Rejuvenating New Jersey via Transportation:* Benefits of a healthier transportation system
- *Prescriptions for Wellness:* Tools to achieve our goals
- *Working Together to Create a Healthier New Jersey:* Education, funding, and technical assistance opportunities

We already have evidence of progress with this philosophy: many communities across the State are already working with NJDOT to make intelligent land use and transportation decisions and realize a new vision for New Jersey. NJDOT has been developing a series of Integrated Land Use and Transportation Planning Studies to promote several positive outcomes for communities:

- lively main streets
- sensible land use

- streets for the community
- lasting investments
- economic vitality
- safe streets for all
- more ways to travel
- healthy streets and communities.



A key element of these studies is empowering towns to partner with NJDOT and other state agencies in creating the transportation/land use balance. Through this collaboration, NJDOT is providing municipalities with the tools they need to make smart development decisions, facilitating communication, and directing them to valuable resources.

Current NJFIT projects are at various stages of completion, but early feedback from local government partners at the county and municipal levels has reflected a strong willingness to bring local resources to the table as they see the broad community benefits of participation in this program. Through this program, NJDOT and the New Jersey Office of Smart Growth (OSG) are helping communities such as Manalapan, Berkeley, and Ocean Township develop the town centers that they never had. In Trenton, we are helping the City redevelop its waterfront in a way that shifts trips to walking or to the nearby Trenton-Camden Light Rail and NJ Transit’s Northeast Corridor service. In other communities, DOT and OSG are helping communities lay out local street grids and mixed land uses that will alleviate the heavy pressure placed on the state highway system by modern development patterns. Some examples of these studies are:

### **Route 1 Regional Smart Growth Strategy—Mercer, Middlesex and Somerset Counties**

NJDOT's Route 1 Regional Growth Strategy is an interactive partnership and planning process focused on combining economic development opportunity with NJFIT principles. The Route 1 strategy involves collaboration with a variety of stakeholders in the development of a planning process that can be replicated in other corridors and regions across the state. The project also aims to increase travel options along this corridor by remedying access management problems and enhancing transit facilities.

### **Route 130 Three-Part Transportation and Planning Effort—Burlington County**

The Route 130 Three-Part Transportation and Planning Effort aims to develop a comprehensive vision for an 11-mile section of Route 130 that passes through 7 municipalities in Burlington County. The three-part study includes a visioning plan, a transportation deficiency assessment, and a context sensitive design implementation plan. These components are designed to lay the groundwork for the transformation of an older arterial road that was viewed as vacant, deteriorated, and undesirable into an opportunity for regional redevelopment that enhances economic as well as transportation goals.

### **Route 33 Manalapan Township Smart Growth Implementation Study—Monmouth County**

The Department, at the request of the local municipality, is developing an integrated transportation and land use plan for Manalapan Township. Due to heavy existing build out in existing residential areas with unconnected local streets, the extensive strip commercial development characterizing Route 9, and heavy com-

muter volume through the area, have created significant congestion in Manalapan. This study focuses on transformation opportunities for strip development along Route 9, reshaping the limited new development in Manalapan (specifically along Rt. 33), and creating a plan for sustainable land use and transportation infrastructure in Manalapan. This study also offers the opportunity for the Department and the New Jersey Office of Smart Growth to assist Manalapan in creating a new town center in their community and for the Department and NJ Transit to explore the possibility of bus service along the Rt. 33 corridor as a means to alleviate some congestion on Route 9.

These successes have enabled NJDOT to forge unprecedented partnerships at the state, county, and local levels and with businesses and academic institutions. Some of the projects emerging out of the NJFIT corridors are already programmed or anticipated. For instance:

### **Route 29 Waterfront Boulevard Study—Mercer County**

The 3-mile section of Route 29 through the City of Trenton is known for its high-speed traffic and high accident rate resulting in a number of fatalities over the last decade. At the same time, it constitutes a major barrier dividing the City from its waterfront. Conversion of Route 29 from a freeway to an urban boulevard will help solve both issues. Rather than to continue to make Route 29 wider and straighter and to cut down trees, which the community values, NJDOT is now looking at redesigns which will actually slow down traffic. While this may cost commuters a few minutes during rush hour, the slower travel speeds will make the road safer for both cars and pedestrians. Slower travel speeds will provide opportunities for better connections to the waterfront, which would not be possible if Route 29 were to remain a

high speed highway. In front of the State House and the War Memorial, NJDOT and the City are also looking at relocating the roadway alignment to retreat from the waterfront, thereby opening up new possibilities for redevelopment in prime locations. This will also position NJDOT and Trenton to recoup much of the cost of the new urban boulevard through the redevelopment process. NJDOT is working with the Capital City Redevelopment Corporation and the NJ Office of Smart Growth to coordinate this project with Trenton's Downtown redevelopment plans.

Other examples of NJFIT corridors are described on the following pages.

# Congestion, mobility, accessibility

## NJFIT—Route 9 Ocean County

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This project involves the study of 30 miles of Route 9 in Ocean County—from Toms River in the north to the Ocean County/Atlantic County line in the south. This facility serves the needs of a series of 12 seashore communities along the coast of New Jersey, many of which have strong historic components.

Land use patterns in this corridor have changed dramatically over the past few decades. What once used to be seasonal homes are being replaced or upgraded to year round residences. Property values have in turn skyrocketed as people seek out this unique seashore lifestyle. Rampant congestion has followed.

Business as usual solutions to congestion and feverish development in the corridor would involve a major widening of the northernmost 20 miles of this stretch of Route 9. With development immediately adjacent to the roadway, the ROW costs would be staggering, and impacts to the viability of the local communities and the natural environment the widening would be devastating. In effect, the cure would likely kill the patient. An estimated \$150 million for property acquisition, and over \$350 million for construction would be needed. Clearly, this is not feasible.

If we do nothing to change the paradigm, local jurisdictions would continue to approve development proposals, based on the unrealistic expectations that NJDOT would find a way to fund and build the necessary roadway widening. It would be irresponsible for NJDOT to continue to mislead communities into believing that we can carry the burden of unsustainable development patterns on Route 9.

Use of the NJFIT: Future in Transportation approach has resulted in the Route 9 communities and state agencies recognizing that we all must come together to address this problem. The Route 9 communities want to explore solutions beyond conventional highway widening and begin to look at integrated transportation and land use strategies. The communities and NJDOT are seeking solutions that will balance the need to continue to develop while maintaining the community character, preserving and protecting the natural and historic resources, as well as maintaining or improving quality of life.

The Route 9 communities would like to develop the tools needed to ensure that the future is something that is desirable and sustainable. As such, NJDOT wants to assist the Route 9 communities in building a more robust transportation infrastructure and a more supportive land use framework that can more proactively respond to growth changes. NJDOT also wants to provide solutions that optimize the resources of the state and have an effect more far-reaching than temporary solutions to individual and recurring symptoms of traffic congestion.

The first major output of this process was the Route Corridor 9 Master Plan which established the 6 Corridor Guiding Principles:

1. Balance Regional Mobility and Local Access Needs
2. Focus on Improving Capacity Where It Counts
3. Reconnect and Enhance the Transportation Network
4. Strengthen Community Character
5. Provide Alternatives to the Car
6. Match Growth to Infrastructure Capacity

In order to implement the Route 9 Master Plan and turn its visions into reality, the Route 9 Corridor Coalition was formed. The coalition is comprised of state and regional agencies and townships and boroughs located throughout the corridor. The coalition meets periodically to share information and discuss issues.

Some early successes have emerged from the process. Ocean Township has recently received approval for the advancement of a town center that will provide an area for economic development in a controlled and environmentally appropriate manner. This project has the ability to actually improve mobility by providing additional roadway in a grid pattern.

Likewise in Berkeley Township, a defunct strip mall is slated for redevelopment into a dense compact multi-use town center. This also involves the establishment of a grid of roadways and would establish environmental areas that would be protected from future development. See graphic below for the layout of the new town center and supporting street grid.

**Route 9 Berkeley Twp.  
Proposed Town Center**



# Congestion, mobility, accessibility

## NJFIT—Route 57 Warren County

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The Route 57 study area encompasses 21 miles of Route 57 from Philipsburg to Hackettstown, which includes 8 municipalities. This effort is a four-part innovative planning process which is unique in that the NJDOT is taking a proactive approach to ensure the long term viability of the corridor as a two-lane roadway. Community participation is vital to each part of the plan's success. Community involvement included participation from municipalities, the County, DEP, the Office of Smart Growth, and the Highlands, as well as residents, business owners, farmers and civic organizations. An Advisory Group was developed to initiate the process and work through the phases of the plan.

During the first part of the project process, several Growth Scenarios were developed. The four scenarios were the Trend, Town Centers, Corridor Villages and Dispersed Villages. After the workshops, a preferred Growth Scenario was developed which combined the Town Center and Dispersed Village alternatives. Development and redevelopment along the Route 57 corridor would be focused in and around existing centers that would minimize points of congestion as well as land consumption in the future. The immediate goal of this was to plan development to avoid sprawl that would overburden the state highway beyond NJDOT's capability to address. Supplemental goals involved helping the region's communities develop implementable and sustainable vision plans *for themselves*.

The second part of the process was the development of a Conceptual Corridor Plan which includes recommendations for economic vitality, environmental preservation,

and transportation safety and efficiency.

Pub -

### l i c **Route 57 Scenario Planning**



participation steered where each of these strategies would be important to the municipalities and county.

In the next step, the Demonstration Plans and Design Guidelines were developed. The four demonstration areas represented the breadth of issues and strategies needed to implement the plan. The team developed design guidelines that illustrated the appropriate density, scale and general characteristics of buildings, streets and public open spaces, among other guidelines.

The last part of the study developed an Implementation Toolkit which can be used by municipalities and counties for planning future development. Some of the tools included in the Toolkit are: Design Guidelines, Plan Endorsement, Street Connectivity, Transfer of Development Rights, Farm Support Services, Scenic Byway Designation, Tourism Support, Greenways and

Trails, and others.

Route 57 study applied a truly holistic view of the corridor. Beyond the innovative planning process, the DOT also supported other efforts in the corridor. Route 57 consists of rural fields, small villages and a center in Washington Borough. Part of the plan was to provide support to each of these different contexts by providing assistance for scenic preservation, traffic calming, and support for redevelopment and traffic calming in each of these areas, respectively. While each of the areas was treated individually, overall the Department is also pursuing a Scenic Byway designation for the corridor. Additionally, spot transportation improvements will continue as needed within the corridor.



Proposed view Eastbound  
Approaching New Village

# Congestion, mobility, accessibility

## NJFIT—Route 33, Manalapan

NJDOT is changing the way we do the business of transportation in New Jersey. History tells us we cannot continue to fight the congestion battle with new roadways, bypass roadways, or widened roadways. Increased highway capacity has, in fact, supported the unmitigated sprawl that has become an epidemic in New Jersey. This is why NJDOT is approaching congestion management with an eye towards balanced solutions that incorporate targeted transportation improvements coupled with land uses that encourage limited trip distances, provide modal choices and support economic growth in our communities.

A good example of NJDOT's new approach is the work being done in Manalapan Township, Monmouth County. Some time ago, Manalapan Township recognized the inevitability of continued growth and development along the Rt. 33 corridor. This largely undeveloped, east-west corridor connects the NJ Turnpike and the heavily congested Rt. 9 corridor. As development pressures mount, the township is faced with the challenge of maintaining the remaining rural context of this corridor. NJDOT recognized the opportunity to work with the township to begin shaping the pending development along the corridor in an effort to prevent an over-reliance on Rt. 33 for local trips in the area and to provide a sustainable devel-

opment plan based on the local vision of the community.

As such, NJDOT has been working with the township, the Office of Smart Growth, Monmouth County, a developer and various other stakeholders to formulate a plan for the development of a large parcel adjacent to Rt. 33 known as *The Village at Manalapan*.

As originally envisioned, the plan would have over-burdened one key intersection on Rt. 33; precluded direct access to the site from the immediately adjacent residential areas; supported automobile dependant 'big-box' uses; and perhaps most significantly, set the precedent for further development along the corridor.

The NJDOT project team began a cooperative effort with the parties involved to revise the plan. This began with a roundtable workshop identifying critical issues and key concerns of all parties. The project

team revised the plan through an iterative process addressing the participant's issues and concerns through the application of Smart Growth principles. The result of this cooperative effort (see plan at left) outlines a conceptual plan which allows for a mixed-use development, a network of public streets, greater

**Route 33 Manalapan Twp. Conceptual Plan**



connectivity to the existing residential areas, and amenities which encourage modal choice and support the vision the township has for its community. Most importantly, however, this plan will provide for the long term sustainability of the transportation system in this area while at the same time set the tone for future development in the corridor.

The concept developed for Manalapan, as well as those developed for various other communities, requires compromise by all parties, and successful implementation will depend on flexibility in design and in the permitting process. However, through partnerships established during the planning phase, NJDOT can help communities leverage private development funds to help build better, more sustainable communities state-wide.

# Congestion, mobility, accessibility

## Intelligent transportation system

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“Intelligent Transportation System”—which includes computerized signal systems, dynamic message signs, and highway advisory radio—is a set of high-tech transportation system management tools that can greatly increase the efficiency of roads and intersections. Capacity improvements of 20% to 25% are not uncommon from ITS installations. And nowhere is ITS more effective than in dealing with non-recurring (or incident-based) congestion and delay. The ability to quickly detect an incident, provide immediate information to the traveling public, and get the situation cleared rapidly, improves system reliability significantly. Consistent with NJDOT’s goals, the deployment of ITS technology helps reduce traffic congestion, improves public health and safety associated with transportation, increases opportunities for local and regional economic development by improving mobility, and enhances the quality of life for towns and communities.

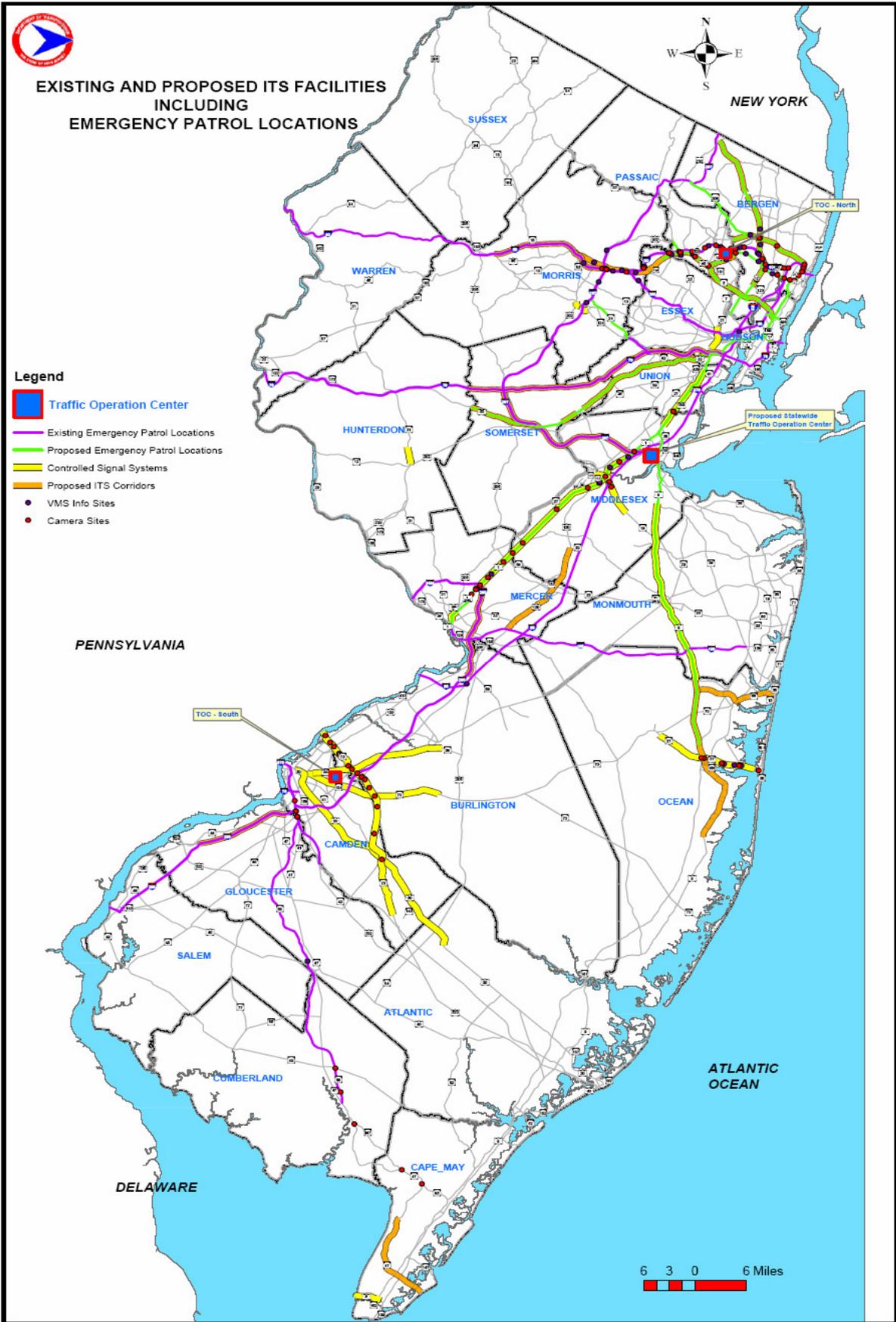
NJDOT began installing Intelligent Transportation System elements in 1992 and now has some level of ITS infrastructure on about 90 miles of interstates and freeways and 235 miles of other state highways. This includes 315 miles of communication fiber, 173 cameras, 77 dynamic message signs, 168 speed detectors, 211 computerized signals, and 14 highway advisory radio transmitters. Locations of existing ITS facilities are shown on the map on the following page.

Two high-tech traffic operations centers (TOCs), originally established in 1996, are the central focus for all transportation operations in the state. They use ITS infrastructure to manage the flow of traffic on the highways and to coordinate responses for traffic incidents. There is also a central

dispatch unit co-located with the State Police and Department of Environmental Protection communications centers to assist the TOCs in coordinating work assignments among various operational units in responding to incidents. Approximately 7,000 incidents are reported to the TOCs every year. NJDOT has completed a statewide fiber network with the New Jersey Turnpike Authority and together are developing a statewide traffic operations center (STOC) in Woodbridge. The STOC is expected to open early 2006 and will have staff from NJDOT, NJTA and the State Police to coordinate traffic information and incident management throughout the state. NJDOT is also working with TRANSCOM for traffic and incident coordination with the sixteen transportation agencies covering the New York Metropolitan area. The Emergency Service Patrol Program (ESP) was launched in 1994 to help keep the highways clear, reduce congestion and increase safety for all motorists. ESP services include fixing a flat, providing gas,



other assistance to get a motorist moving again, or clearing a vehicle from the highway. Since inception, ESP motorist assists



Source: Bureau of Systems Development and Analysis

have steadily increased, with over 67,000 in 2005. The ESP has a benefit to cost ratio of 19 to 1 based on the savings in time provided by clearing lane closing incidents. ESP units in the South patrol from 4:00 a.m. to 10:00 p.m., seven days a week. In the North coverage is from 4:00 a.m. to 8:30 p.m., Monday through Friday, with additional coverage on holiday weekends. The ESP program currently covers over 385 miles of interstate and freeways.

NJDOT's website ([www.state.nj.us/transportation/commuter/trafficinfo/](http://www.state.nj.us/transportation/commuter/trafficinfo/)) provides real-time traffic information, including live camera views of actual highway conditions. The number of "hits" on this website has increased significantly. A 511 phone service to provide real-time traffic information has been developed and is currently being coordinated with the 22 phone companies



in New Jersey for deployment by mid-2006. The service will allow callers to receive the current status of traffic on any requested

segment of highway.

NJDOT also programs a small amount of funding annually for the "Smart Move" program for low-cost ITS improvements. However, as part of the recent congestion investment scenario analysis, increases in funding levels for "Quick Fix" and ITS projects and programs were recommended to provide for a more integrated and cost-effective approach to congestion relief. Some examples of projects that have been done under this program are:

- Construction of 20 cameras at locations throughout the state, including I-287/I-78, I-78/Rt 21, I-287/I-80, I-80/Rt 15, I-78/Rt 1&9, Rt 50/GSP, and I-280/Stickel Bridge
- Construction of 25 variable message signs at locations including I-295/Rt

130, Rt 3/Rt 17, Rt 3/Rt 1&9, Rt 9/Rt 18, and Rt 55/Rt 47

- Connection of the central dispatch unit into the fiber network to provide secure communications and provide for backup coverage between the TOCs
- Retrofit the Rt 18 controlled traffic signal system to provide for optimum traffic flow

NJDOT's capital investment strategy for intelligent transportation system (ITS) improvements calls for expanding and improving the technical base and services available.

# Goods movement

## Freight movements and New Jersey's economy

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New Jersey is now part of a vibrant global economy with goods sourced, produced and marketed throughout the world. As part of this enormous economic market driven by the demands of consumers and producers worldwide, New Jersey is a key player in the competition for international business.

New Jersey's multimodal goods movement network delivers the food we eat, the

consumer products we buy, and is an essential underpinning to virtually every aspect of the State's economy. The network is characterized by extensive roadways, rail lines, major air and port complexes. The infrastructure itself developed over time and has had to adapt to changing freight transportation demands, distribution patterns, and equipment. Each year, numerous public and private sector entities work in unison to move over 600 million tons of freight into, out of, and through the State.

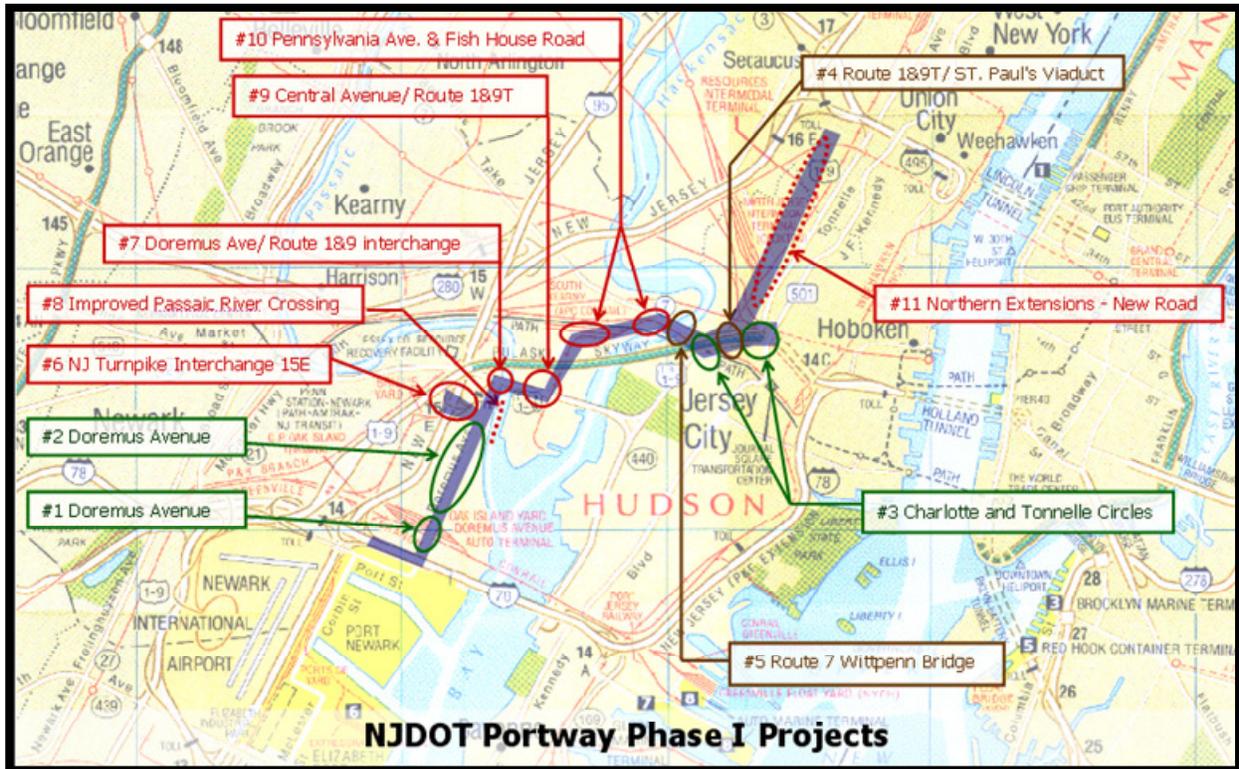
The critical role of the network is matched in scale by the challenges it now faces. Sustained and rapid growth in the number of imports under a more global economy coupled with rising expectations about reliability and on-time delivery have created heavy demands on our goods movement network. These demands will continue to grow at an increasing rate.

NJDOT actively seeks to address goods movement network challenges from a systems perspective by engaging in a wide array of activities. These include the advancement of projects through the traditional pipeline process; direct funding of rail projects through the short line rail assistance program; working with innovative multi-agency and public/private funding partnerships; collaborating with other transportation agencies as well as other public and private sector entities; and providing information to the public.

The goal of these activities is to improve the safety and efficiency of the transportation system, facilitate the efficient movement of goods, promote economic development and redevelopment consistent with smart growth, balance freight needs with other users of the network, and enhance the quality of life for New Jersey residents.

The key capital investment challenges for NJDOT for the next 10 years are advancing the Portway Program projects, working with Class 1 railroads to improve their infrastructure and capacity, providing support for short-line railroads, supporting maritime infrastructure needs, and advancing future projects identified through our on-going freight planning process.





NJDOT is in the process completing the first comprehensive Statewide Freight Plan.

The plan will:

- Describe the goods movement transportation network in New Jersey from a physical, operational, economic, and citizen's perspective.
- Produce a synthesis of previous work and outreach highlighting issues, trends, challenges and opportunities in goods movement in New Jersey.
- Identify, evaluate and recommend alternative options/policies that address constraints by mode.
- Increase public understanding of the goods movement and logistics issues.
- Develop better tools and performance measures to evaluate freight issues and options.
- Strengthen partnerships and coordination with sister transportation agencies, other government organizations, private industry and the public.

Additional projects and programs may result from the data and analysis produced.

The cost associated with additional freight related projects has not been estimated. Funding will need to be addressed for projects arising within the 10-year time horizon.

# Goods movement

## Meeting the need

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First and foremost, the nearly nine million people who live in the state alone consume a huge amount of goods. When another 114 million people are included as part of the consumer market within one day's drive for a total of 123 million people, the dimensions of the demand for freight grow exponentially.

Goods are also needed at every workplace and retail center, and raw materials and unfinished products are essential to the manufacturing sector of the state's economy. Presently, there are 4.4 million Twenty Foot Equivalent (TEUs) coming to the Port Authority of New York and New Jersey; this is expected to grow to over 8.0 million TEUs within 10-15 years.

Investment in a goods movement program is essential to the economy of New Jersey. NJDOT invests in four major programs targeted at improving goods movement in New Jersey:

- The Portway initiative
- The Rail Freight program
- The capital improvement partnership with Class 1 railroads
- The maritime program

The **Portway** program seeks to improve access to and between the Newark-Elizabeth Air/Seaport Complex, intermodal rail facilities, trucking and warehousing/transfer facilities and the regional surface transportation system. These facilities and their access routes are the front door to global and domestic commerce for New Jersey. The program has two elements: Phase One projects and the Portway Extensions Study. Phase One consists of 11 specific projects along a 7-mile long corridor: three completed (Doremus Avenue bridge

and Doremus Avenue rehabilitation in Newark and Charlotte and Tonnelle Circles in Jersey City), two in final or preliminary design (Route 1&9T St. Paul's Avenue Bridge and Route 7 Wittpen Bridge), and six in feasibility assessment. Total cost of Phase One is approximately \$1 billion, half of which consists of the St. Paul's and Wittpen bridges—two of our "high-cost" bridges. Current phases of work for the Portway projects are fully funded. Outyear needs are not. The Portway Extensions Study has issued a report (available on NJDOT's website at [www.state.nj.us/transportation/portway/](http://www.state.nj.us/transportation/portway/)) that identifies needs beyond Phase One and recommends extensions that facilitate goods movement operations (especially for containers) from northern New Jersey ports to their next destination.

The **Rail Freight** program provides support for reconstruction and rehabilitation of the state's 14 short-line railroads. Following the reorganization of the Northeast railroads in the 1970s, Congress provided a modest program to assist the development of "short-line" railroads and the rehabilitation of branch lines, many of which had been neglected for years. New Jersey began its state-funded program to replace the federal program, which was phased out in the 1980s. In recent years, this program has been funded at a level of approximately \$10 million a year from the Transportation Trust Fund. Projects are primarily selected from the State Rail Plan, which prioritizes the needs of short-line operations. Given the condition of old railroad infrastructure currently in place, additional funding will be needed to meet growing reconstruction and rehabilitation requirements. The NJDOT Commissioner can

also select projects involving Class 1 railroads and projects which facilitate truck movements.

The **Class 1** (major) **railroads** serving New Jersey, in collaboration with NJDOT, have proposed a rail freight improvement plan to eliminate bottlenecks in the system and serve the growing needs of the economy. A total of \$200 million in funding is required for all the identified improvements. NJDOT, the Port Authority of New York and New Jersey, and Class 1 railroads have entered into an agreement to fund the first phase of projects at a total cost of \$50 million. Projects within Phase II have been identified. The shared funding source for approximately \$150 million is being identified.

NJDOT's **Maritime Program** supports a number of activities vital to New Jersey's \$50 billion maritime industry, including channel dredging, ferry infrastructure, the National Boating Infrastructure program, and the Port Inland Distribution Network. The industry is located along 127 miles of New Jersey shoreline, on 116 state navigation channels, 240 miles of navigable waterways in the New Jersey/New York Harbor, and along 106 miles of the Delaware River and Bay. New Jersey's bookend ports supply our region with fuel to heat homes and businesses, clothing, fruit, coffee and all of the goods used by citizens daily. The maritime industry also includes the commerce that makes New Jersey's quality of life desirable.

Most of the needs of these programs are met from other sources. The NJDOT capital program normally provides about \$4 to \$6 million per year to finance NJDOT's partnership role in these areas. For example, about \$6.1 million is allocated to the Maritime Program.

# Economic development

## Targeting projects to enhance economic development

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Transportation economists agree that the principal contribution transportation agencies can make to economic development is to minimize the cost of transporting people and goods by maintaining transportation systems that are efficient, well-planned, and in a state of good repair. However, targeted transportation improvements can be effective in selective circumstances for attracting or retaining major employment centers, for bolstering weak market forces in redevelopment areas, and for leveraging private development funding.

NJDOT's capital investment strategy calls for:

- Investing in selected projects which promote appropriate economic development
- Improving access to more job opportunities
- Providing for more cost-effective movement of goods
- Upgrading intermodal facilities and access to them
- Improving access to passenger and freight facilities to serve international markets
- Stimulating tourism
- Encouraging development and redevelopment around transit facilities

Although most projects benefit economic development in one way or another, some provide very specific, "targeted" economic development results. NJDOT is considering whether New Jersey would benefit from the establishment of a special economic development setaside program with clear methodologies for evaluating costs and benefits. Such programs are common in many states but have been used to only a limited extent here.

In the meantime, NJDOT is participating in projects to support economic development in urban centers such as Camden, Newark and Trenton, in addition to the Meadowlands, Flemington and other sites. These projects are all reviewed to ensure that both the transportation improvement and the broader development plan are consistent with the State Development and Redevelopment Plan and all other applicable plans. In general, NJDOT's policy is that the transportation capital program should fund the direct transportation benefit provided, while other benefits are funded by other stakeholders. In practice, of course, the actual "share" paid for by various parties (including public and private partners) will reflect their ability to participate as well as their perceived benefits.

A good example of a current partnership project is the planned improvement on Route 130 at Cinnaminson Avenue in Burlington County. Here the county, the town, and the developer, as well as NJDOT, have partnered to design and implement roadway improvements which will promote safety and improve traffic flow while allowing the redevelopment of an old shopping center site as the southern "anchor" of the Route 130 "River Route" redevelopment plan.

# Aviation

## Meeting the needs of New Jersey's airports

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New Jersey's air carrier and general aviation airports are vital links in our transportation system. They are critically important for retaining and attracting major businesses and industrial firms, especially high value and time sensitive industries such as finance, pharmaceuticals, and professional and corporate headquarters operations.

NJDOT's capital investment strategy for aviation calls for providing support to keep airports safe and in a state of good repair and to retain key airports in operation. The State of New Jersey continues to implement the nation's most preeminent and successful program for preserving public use airports. Since 1950, the number of public use airports in NJ has declined from 82 to 47. Many smaller airports are in private ownership and are tempting targets for developers. Beginning in 1983, with establishment of the New Jersey Airport Safety Fund, NJDOT has been able to provide support for repair and rehabilitation efforts at smaller airports. Since 1998, with a combination of federal, state and local funds, NJDOT has been able to ensure that seven airports were preserved from development, either through outright purchase or through purchase of development rights. The program incorporates the doctrines of both "fix-it-first" and "smart growth." principles

NJDOT's goals for a safe and efficient aviation system are:

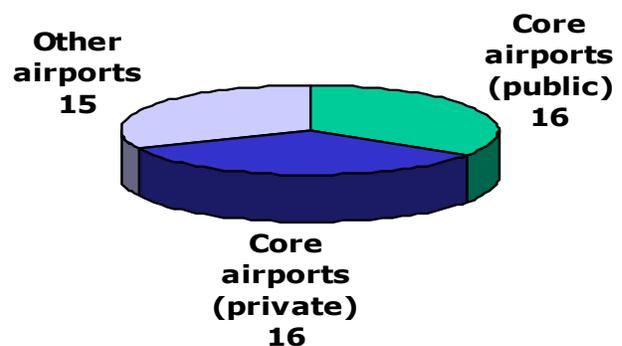
- Preserve existing public use airports, especially "core system" airports.
- Progressively rehabilitate and redevelop existing public use airports within existing property lines to maximize the use out of existing airport acreage.
- Increase the capacity (number) of high-

quality aircraft parking/storage spots and the 24/7 availability of aircraft fuels throughout the entire airport system.

Except for two high-cost preservation projects, and with periodic use of Federal discretionary funds, the above goals can be largely met over a 10-year period at existing programmed State and Federal funding levels. This presumes continuing use of value engineering and of preventive maintenance to extend the service life of existing infrastructure.

The two high-cost projects are the preservation of Solberg (Hunterdon) and Allaire (Monmouth) Airports. These projects will likely require multi-year funding and very substantial TTF and FAA funding.

### New Jersey's 47 Public Use Airports



# Local aid

## Meeting the needs of counties and municipalities

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NJDOT's capital program provides significant state and federal funding to meet the needs of counties and municipalities. Thanks to Governor Corzine's plan to reform, replenish and grow the New Jersey Transportation Trust Fund, the Trust Fund local aid program has been increased to \$175 million a year. This is divided into three program:

**The County Aid Program is \$78.75 million.** These funds are allotted to New Jersey's 21 counties by a formula that takes into account county road mileage and population. Each county develops an Annual Transportation Program (ATP) that identifies projects to be undertaken and their estimated cost. Projects may be improvements to public roads and bridges under county jurisdiction, public transportation or other transportation related work. Upon review and approval of the ATP, NJDOT provides up-front funding for the full amount of the county allotment. Approximately 100 county highway and bridge projects are funded each year.

**The Municipal Aid Program is \$78.75 million.**

These funds are appropriated for municipalities in each county based on a formula that takes into account municipal road mileage within the county and county population. Then, these funds are allotted to individual projects within various municipalities through a competitive application based process. The funds can be used for transportation improvements under municipal jurisdiction and typically include road improvement projects such as resurfacing, rehabilitation or reconstruction and signalization. Special set-asides are also made for municipalities that qualify for Urban Aid and for Newark and Jersey City. More than

400 Municipalities are allocated funding for municipal projects each year.

All 566 municipalities may apply for Municipal Aid. Projects may be improvements to public roads and bridges under municipal jurisdiction. Applications are solicited, evaluated and rated by NJDOT staff. The results are presented to a Screening Committee comprised of municipal engineers and the staff of the Division of Local Aid and Economic Development. The Committee evaluates the projects and makes recommendations to the Commissioner for approval. NJDOT will pay 75% of the award amount or the allotment, whichever is less, at the time that the award of construction is approved.

**The Discretionary Aid Program is \$17.5 million** or 10% of the total State Aid Program subject to the annual appropriation by the Legislature. These funds are established to address emergent or regional needs throughout the State. Any county or municipality may apply at any time. These projects are approved at the discretion of the Commissioner. Approximately 50 to 100 projects are funded each year.

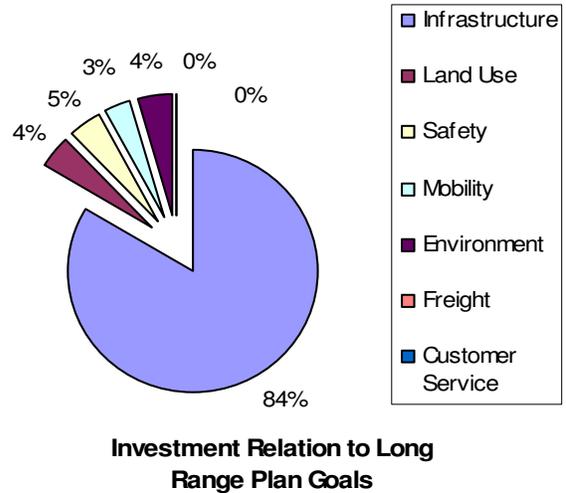
There are also several specialized programs available to counties and municipalities using both Trust Fund and federal dollars. These include:

- Local Aid for Centers of Place
- Local Safety program
- Local Scoping
- Local Lead
- Local Bridges
- Transportation Enhancements
- Transit Villages
- Safe Streets to Schools

More information on the Local Aid program can be found on NJDOT’s website at [www.state.nj.us/transportation/business/localaid/](http://www.state.nj.us/transportation/business/localaid/).

The capital investment strategy for local aid calls for:

1. Improve and maintain the transportation infrastructure—Local Aid’s core programs, Municipal Aid, County Aid and Discretionary Aid focus on providing financing to counties and municipalities for infrastructure repair
2. Integrate transportation and land use planning—Local Aid administers two grant programs that reward municipalities who have received special designations because of good land use planning practices. They are the Centers of Place Grant Program and the Transit Village Grant Program.
3. Increase safety—Beyond its core State Aid Program and Federal Local Lead projects, the Division of Local Aid administers several programs that focus specifically on safety of pedestrians, motorists and cyclists. They are the Safe Streets to Schools Program, Local Safety Program and the Highway Safety Fund Program.
4. Increase mobility—A number of Local Aid’s grant programs reward using alternate modes of transportation such as bicycles, rail or even foot. Those programs are the Bikeway Program, Transportation Enhancements Program, Transit Village Program and the Safe Streets to Schools Program.
5. Enhance the environment—Through both the federal Transportation Enhancement Program and the Centers of Place Program, Local Aid provides grants that focus on non-traditional transportation improvements to improve the quality of life of New Jerseyans, including enhancing the environment.
6. Optimize freight movement—Although we have no freight-focused programs, Local Aid may work with counties and municipalities to fund truck related improvements on county or local facilities



- to enhance freight movements. Many key freight links are county or municipal facilities.
7. Continually improve the process of providing transportation facilities—Local Aid works closely with the New Jersey Municipal Engineers Society and the New Jersey Association of County Engineers to constantly improve the local aid funding process and the delivery of local projects. This may take the form of regulation reform, contracting reform, dissemination of information on innovative practices or materials, or by acting as a broker to resolve programmatic issues with other NJDOT units, FHWA or other agencies. A top NJDOT priority is improving the efficiency of the use of local aid funds and eliminating backlogs of unspent funds.
  8. Improve Customer Service—NJDOT is looking for ways to make the Local Aid process easier. One of the key initiatives to advance is the web-based grant management system. This system will allow our primary customers; municipalities, counties and non-profit agencies, to submit applications on line, track grant funding and foster better communication with the NJDOT.

In an effort to link capital investment strategy principles with the Long Range Transportation Plan Goals, the following is recommended:

- Ensure that local transportation investments align logically with the goals of the State's Long Range Transportation Plan.
- Investment programs should return a reasonable rate of project delivery or be modified or abolished.
- Consolidate/minimize programs to the extent possible to minimize administrative costs of both the State and local governments.

# Quality of Life/Environment

## Improving the natural, cultural and built environments

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Improving the quality of life was the impetus for early roadway improvements and the first federal aid highway program. The deplorable condition of most roadways beyond the city limits made cycling [a popular diversion at the time] unsafe and laborious. Cycling groups joined together to lobby for better roadways at federal, state and local levels. The League of American Wheelmen spearheaded the national Good Roads Movement to secure road improvement legislation. The introduction of the automobile in 1908 and its immediate popularity exacerbated the problem. With rural interests adding their demands to "Get the farmers out of the mud!" the need to provide a deliberate and continuous focus on roadway improvements could no longer be ignored. The Federal-Aid Road Act of 1916 created the Federal-Aid Highway Program, which made funds available to state highway agencies to assist in road improvements on a continuous basis. Thus the current commitment to improving the quality of life in the context of roadway work only echoes the values of the early users of the roadway system.

The challenge for NJDOT is to integrate the philosophies of environmental stewardship, context sensitive solutions and Smart Growth routinely into its work. When done successfully, the net effect can be the formation of partnerships with reviewing agencies, special interest groups, and the public where all members are working together to seek the **best** solutions to transportation problems, as well as an expedited project delivery process. Activities and initiatives which foster the public perception of the NJDOT as an agency that is committed to stewardship of the natural and cultural environment, and to making a significant improvement to the quality of life in

NJ **as key elements of doing business** are critical to building credibility, and are accomplished at relatively low costs.

NJDOT's goal is to ensure that all transportation improvements enhance the quality of life, create partnerships, and promote environmental stewardship and aesthetics consistent with community context and values.

There are many environmental and quality of life programs and projects undertaken at NJDOT, some of them overlapping with other areas discussed in this report. Following is a description of some of a few of the major initiatives:

**Transportation Enhancement Program**—provides funding through SAFETEA-LU to support non-traditional transportation projects whose objectives support more livable communities, enhance the travel experience, and promote new transportation investment partnerships. Typical projects would include bicycle and pedestrian improvements, scenic beautification, downtown streetscapes, historic preservation of transportation related buildings or facilities, and environmental mitigation to highway projects.

**Local Aid for Designated Transit Villages**—provides funding to communities that have been selected for inclusion in the Transit Village Program. It focuses on projects in a community that plan and encourage mixed-use redevelopment near passenger transportation facilities.

**Scenic Corridor Preservation Pilot Project**—Scenic Preservation on Route 57 is an innovative pilot program aimed at preserving mobility and deterring sprawl development. In 2002, NJDOT

programmed \$1 million to begin a corridor scenic preservation effort. These funds were transferred to the county government to acquire parcels abutting Route 57 that were judged to be of significant scenic value based on an extensive analysis of the whole corridor. The property is development restricted and may be used by the county either for open space, farming, or future parkland.

**New Jersey Birding and Wildlife Trails, Delaware Bayshore**—NJDOT worked with the NJ Audubon Society, the NJ Department of Environmental Protection and the NJ Office of Travel and tourism to develop a comprehensive guidebook for nine driving tours that highlight wildlife viewing destinations and other sites of interest in Salem, Cumberland and Cape May Counties. The guidebook is easy to use, well illustrated, and well organized. US Fish & Wildlife Service information indicates that in 2001 1.6 million NJ residents and 688,000 visitors engaged in birdwatching in New Jersey, spending over \$1.2 billion on tourism.

**Good Neighbor Landscaping Program**—The Good Neighbor Landscaping Program provides funding for statewide landscape projects and is administered by the Landscape and Urban Design Unit. The scope of work for the program includes the planting of trees, shrubs, vines, ground covers, and other landscape elements including planting backfill, mulch, water, small scale unit pavers, small scale unit retaining wall installations and general preparation of the proposed planting areas.

**Wireless Communications Wildflower Program**—The Wireless Communications Wildflower Program utilizes Wireless Communication funds to plant wildflowers on State right of way in wireless host communities throughout the state. The program is a cooperative effort between the Major Access Permits Unit, Wireless Communications, the Landscape and Urban Design Unit and Maintenance and Operations in Regions North, Central and South.

**Scenic Byways Program**—The New Jersey State Scenic Byways Program was created to preserve, maintain, protect and enhance the scenic, historic, recreational, archeological, natural and cultural intrinsic qualities of New Jersey's Scenic Byways through community-based consensus building and stakeholder partnerships.

New Jersey has four designated State Scenic Byways.

- Delaware River Scenic Byway (31 mile corridor in Mercer and Hunterdon Counties)
- Millstone Valley Byway (25 mile corridor in Somerset County)
- Palisades Interstate Parkway (11 mile corridor in Bergen County)
- Southern Pinelands Natural Heritage Trail (130 mile corridor in Atlantic, Burlington, Cape May, Cumberland and Ocean Counties)

Three proposed byways are in the process of being nominated as State Scenic Byways

- Route 57 Scenic Byway (21 mile corridor in Warren County)
- Delsea Scenic Byway (150 mile corridor in Salem, Cumberland and Cape May Counties)
- Historic Farmland Byway (25 mile corridor in Monmouth County)

**Context Sensitive Solutions Options Book**—This document is in the final stages of development by the Landscape and Urban Design Unit. The CSS Options Book categories include: barrier curb, benches, bollards, crosswalks, curbs and gutters, bridge fencing, fences, guiderail, landscaping, multi-use paths, noisewalls, bicycle and pedestrian lighting, roadway lighting, parapets, planters, railings, pavement, sidewalks, traffic signal poles and mast arms, signs, trash receptacles, tree grates and walls.

**Blue Star Memorial Highway Program**—The Blue Star Memorial Highway Council in New Jersey is the link between the Department of Transportation and the

Garden Club of New Jersey. Council members are appointed by the Governor and include members of the Garden Club of New Jersey, the New Jersey Department of Transportation, the New Jersey Department of Military and Veteran's Affairs and the New Jersey Department of Environmental Protection Office of Historic Preservation. The Blue Star Memorial Highway Program is a living tribute to the men and women who have served, are serving or will serve in the nation's armed forces. Currently there are Blue Star Memorial markers at 22 locations throughout the state including Route 22 which is designated as the Blue Star Drive.

**Historic Bridge Preservation Program—**

This program currently provides funding to Counties for enhanced maintenance and rehabilitation activities on bridges eligible for and/or listed on the NJ and National Registers of Historic Places.

**Construction monitoring—**In addition to the resident engineers, NJDOT environmental staff are monitoring construction sites for compliance with permit commitments and to assist in the resolution of any environmental issues which arise during the construction process.

**Invasive Species Initiative—**in partnership with the NJDEP and NJ Department of Agriculture's Beneficial Insect Laboratory, NJDOT staff are working to reduce the negative effects of the proliferation of invasive species in wetland mitigation areas.

**Grassland Eco Mow Zone Program**

**"GEMZ"**—Maintenance and Operations and the Landscape and Urban Design Unit have developed a pilot Grassland Eco Mow Zone Program "GEMZ" which utilizes an intelligent mowing strategy at selected statewide locations. It is anticipated that this program will provide significant cost savings by delineating GEMZ areas on aerial photos for use by mowing equipment operators.



# **NJ TRANSIT**

# **CAPITAL INVESTMENT STRATEGY**

# ***EXECUTIVE SUMMARY***

When it was established twenty-six years ago, NJ TRANSIT inherited a collection of bankrupt railroads and bus companies. The Corporation's initial capital programs focused on melding these disparate services into one system and improving reliability, after years of disinvestment by private enterprise.

The opening of Secaucus Junction in 2003 marked a key milestone in NJ TRANSIT's efforts to integrate the private sector services it inherited into a single, intermodal network.

The goal of NJ TRANSIT's Capital Investment Strategy (CIS) is to improve the reliability, frequency and geographic reach of this network to increase transit ridership, promote smart growth and drive the state's economy.

- First, the Ten-Year Capital Investment Strategy calls for continued investment in the state's transit infrastructure to achieve and maintain a state-of-good-repair. This improves reliability of the transit network and ensures continued satisfaction of existing customers. The CIS targets infrastructure rehabilitation, bus and rail equipment replacements and technology improvements to modernize customer information and fare collection systems.
- Second, there is a tremendous need to grow core transit system capacity to serve ambient market growth and new customers. As NJ TRANSIT approaches the end of an era characterized by investments to integrate its predecessor railroads into one rail system, capacity improvements are becoming more critical.

Increasing rail capacity along the Northeast Corridor into Midtown Manhattan is the keystone of future capacity. This corridor, as no other, exemplifies the success of transit and its future potential. The Northeast Corridor necks down from four or more tracks to two tracks as it approaches Penn Station in Midtown Manhattan. This portion of track must be improved to accommodate more train service to Manhattan and throughout New Jersey, and to allow the number of rail lines providing direct service to Manhattan to increase above the current five lines.

In addition to increased capacity of rail and bus right of way, the Capital Investment Strategy calls for expanded commuter parking and the creation of new regional inter-modal park & rides.

- Finally, the CIS also calls for selective service expansions that work with and fully complement prior investments.

NJ TRANSIT's Capital Investment Strategy will guide transit investments in New Jersey for the next ten years. Implementing the CIS will deliver an improved transit system to the state, one of greater reach, reliability and level of service.

# Introduction

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Created by the Public Transportation Act of 1979, NJ TRANSIT was established to acquire, operate and contract for transportation service in the public interest. In 1980, NJ TRANSIT purchased Transport of New Jersey, the State's largest private bus company at that time. Between 1981-85, the services of several other bus companies were incorporated into NJ TRANSIT Bus Operations, Inc. On January 1, 1983, a second subsidiary, NJ TRANSIT Rail Operations, Inc. was launched to assume operations of commuter rail in the State after Congress ordered Consolidated Rail Corporation (Conrail) to cease its passenger operations. A third subsidiary, NJ TRANSIT Mercer, Inc., was established in 1984 when the agency assumed operation of bus service in the Trenton/Mercer County area. In 1992, following a full reorganization, all three subsidiaries were unified and operations were significantly streamlined.

NJ TRANSIT is the nation's third largest provider of bus, rail and light rail transit, providing services to major points in New Jersey, New York and Philadelphia. The agency operates a fleet of 2,040 buses, 1,111 trains and 65 light rail vehicles. NJ TRANSIT provides nearly 232 million passenger trips each year on 238 bus routes, 3 light rail lines and 11 commuter rail lines statewide.

NJ TRANSIT also administers several publicly funded transit programs for individuals with disabilities, senior citizens and those living in the state's rural areas who have no other means of transportation.

NJ TRANSIT is committed to provide safe, reliable, convenient, cost-effective transit services to the people who live and work in

New Jersey.

## ***THE ROLE AND BENEFITS OF TRANSIT IN NEW JERSEY***

Funding of public transportation is unique among public investments for its wide range of social and economic benefits. Perhaps first among these benefits is the integral role that public transportation plays in supporting the state's economy.

One of New Jersey's most important competitive advantages is its considerable transportation infrastructure. If goods and people cannot flow smoothly throughout the state, New Jersey's long-term economic prospects are considerably diminished. Public transportation is an important component of New Jersey's transportation system because it targets one of its greatest enemies: congestion.

Transit's role in the overall transportation network primarily has been one of demand-side management for highway trip growth. Transit provides the necessary additional peak period capacity to get people to work in the region's dense employment concentrations. Without transit, many of the region's jobs would be virtually inaccessible due to what would be intolerable levels of highway congestion.

Given the high cost of building new roads in densely populated New Jersey, it is less expensive to improve transit in select corridors. For example, if all of New Jersey's New York-bound commuters were to be accommodated on roads, eight more tunnels and two more bridges would need to be constructed across the Hudson. If all of the state's transit riders occupied cars on

the Garden State Parkway instead of buses and trains, all lanes of the Parkway would be filled end to end.

Transit has been successful in fulfilling its role of reducing demands on the highway system. According to the 2000 Census, one out of every ten New Jersey workers uses public transportation to get to work, double the national average. In select corridors, like New Jersey crossings to Manhattan, transit's market share is over 80% (including commuter rail, bus, PATH and ferry). New Jersey has the second highest transit use of any state except New York, and is home to five of the top twenty transit cities in the country.

Looking forward, transit's role in accommodating trip growth in New Jersey is increasing. According to the 2000 Census, the percentage of New Jersey workers using transit is increasing for the first time in 40 years. As population increases result in greater trip growth, the transportation network must respond. If highway capacity expansion is constrained, public transportation systems become one of the few viable options for accommodating future trip growth.

In addition to accommodating commuters, public transportation is playing an increasingly important role in carrying off-peak and weekend trips. New Jersey's congestion problem is extending beyond the morning and evening weekday rush hours. Shore traffic, mall traffic and overall population density have resulted in a state where no time is safe from congestion. Yet congestion in these times threatens industries that are key to the state's economy, such as tourism and retailing.

Public transportation also plays an important role in promoting specific economic development. By their very nature, train stations and other transit hubs concentrate people into a limited area, creating localized markets for retailers and commercial enterprise. This concentration also allows for greater densities in economic development. The economics of large commercial buildings require access by transit to alleviate the real estate costs otherwise associated with park-

ing. In Jersey City, for example, the number of parking spaces required for commercial development can be less than half that for suburban development, due to the city's access to transit. Also, in congested areas, transit provides access to a larger labor market, since workers can commute from greater distances.

Transit also increases local property values. In heavily congested New Jersey, easy access to public transportation results in high demand for area housing. For example, as NJ TRANSIT extended Midtown Direct service to Montclair in 2002, the town had the highest increase in property values of any municipality in the country. Transit can also benefit the local economy of a community, as Midtown Direct service demonstrated, by adding \$60 million in disposable income to the towns served from new people moving in as a result of the new service to New York.

Beyond the benefits to the state's economy, transit investment also has social benefits. Public transportation provides an important safety net for those who cannot drive, whether due to age (both young and old), disability or for economic reasons. Almost 10% of New Jersey's households do not have access to a car. As New Jersey's population ages, more and more people in the state become transit-dependent. NJ TRANSIT provides an important transit service for those who cannot access the highway network.

Transit also promotes smart growth and improves the general quality of life in the communities it touches. Studies have shown that people prefer to live in dense, walkable communities with easy access to public transportation. People use transit because it's faster, more convenient and more pleasurable to use than other means of transportation. Transit builds neighborhoods, reduces urban blight and fosters economic development.

### ***NJ TRANSIT TODAY***

New Jersey's present rail and commuter bus systems primarily serve New York markets. There is an extensive local bus route network serv-

ing the state, focused more on areas where development is concentrated and areas with proportionately more transit dependent population. Over the past ten years, NJ TRANSIT's ridership grew by 30%, mirroring the growth in the State's economy over the same period.

The condition of the transit infrastructure and equipment is much improved from the days of private control, but significant deficiencies still remain. Increases in congestion on the state's highways have shifted auto users to the rails and express bus system, giving rise to severe crowding on the rail network, particularly into Manhattan, and negatively impacting the competitiveness of the bus network as well.

Past investments have focused on integration of what was a hodgepodge of privately controlled railroad and bus lines into a more modern and integrated transit network. As these investments come to fruition, the potential exists for a significant change in the makeup of transit riders in New Jersey.

### ***PRESENT AND FUTURE DEMAND***

Demographers predict that New Jersey's population will increase by 1.4 million between 2000 and 2020, or 16% according to the New Jersey Department of Labor. New Jersey's labor force is also forecast to grow by 0.9 million, or 21%. Since the majority of NJ TRANSIT's ridership is work related, it is possible that travel demand would grow by about 20% over this period.

However, the amount of transit ridership growth over the next 20 years will depend on the pattern and location of future household and employment growth, and the amount of congestion in the state. Implementation of smart growth principles, increased congestion and the aging of the population could significantly boost transit ridership.

# A Vision for a Different Kind of Transit System

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NJ TRANSIT's vision for the future of transit in the state is a transit network that provides integrated transit service across modes for commuters as well as travelers on business and recreational trips.

Increases in trip demand resulting from demographic trends indicate that NJ TRANSIT must change its services to better accommodate trips within New Jersey and to encourage more auto users to switch to transit. While the New York markets represent a strong and growing foundation of the state's transit ridership, there is an increased need to serve existing and new markets within the state for commutation, recreational and other purposes, especially to communities and major employment concentrations consistent with smart growth policies.

In order to make the vision a reality, the existing network must first be brought to a state-of-good-repair. Service reliability is paramount and is dependent on the condition of the infrastructure. If the backbone of a state-of-the-art, customer-friendly transit system is the existing railroad infrastructure, that infrastructure must be well maintained. Similarly, the condition of the highway and road network must also be well maintained to accommodate bus trips.

Investments must also be made to expand the core capacity of the existing transit system to allow for more frequent service. More parking and improved access are key elements of the makeover, as is better use of technology to produce a fare collection system that is faster and easier to use. Crowded stations and terminals must be



expanded and modernized and rail and bus equipment must be overhauled or replaced. Most importantly, key bottlenecks, such as the area under the Hudson River, must be eliminated to allow more frequent service statewide. Finally, the geographic reach of the system must be expanded to make transit more accessible by a wider cross-section of customers.

# Ten-Year Capital Investment Strategy Overview

The Ten-Year Capital Investment Strategy calls for continued investment in the state's transit infrastructure to achieve a state-of-good-repair and provide safe and reliable statewide transit service. The CIS allocates \$6.75 billion dollars, or 36% of the total requested funding, to bring the system to a state-of-good-repair and maintain it at that level. It includes the funding necessary to improve NJ TRANSIT's infrastructure, customer service and new technology, and debt on equipment replacement.

There is a tremendous need to grow core transit system capacity to serve ambient market growth. As NJ TRANSIT approaches the end of an era characterized by investments to integrate its predecessor railroads into one rail system, capacity improvements are becoming more critical. \$6.09 billion, or 32% of the Capital Investment Strategy will be used to increase core transit capacity frequency.

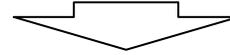
There is also a need for selective service expansions that work with and fully complement prior investments. \$2.42 billion, or 13% of the Capital Investment Strategy will be used to expand off the existing core system. It includes the funding debt on light rail and system expansion program.

In addition, another \$3.56 billion, or 19%, will be required to fund operating expenses.

## NJ TRANSIT Capital Investment Strategy

### STATE OF GOOD REPAIR

- Rehabilitate Railroad Infrastructure
- Modernize Bus and Rail Fleet
- Rehabilitate Stations and Terminals
- Improve Customer Service Technology



### EXPAND CAPACITY, INCREASE FREQUENCY

- Construct a new Trans-Hudson Rail Tunnel
- Expand Park & Ride Capacity
- Expand Rail Fleet
- Coordinate Highway Investments with Bus



### EXPAND REACH OF THE TRANSIT SYSTEM

- Expand the existing system



### **GOAL:**

**A more attractive, reliable and frequent transit system with greater reach that attracts more customers and combats congestion**

## **NJ TRANSIT TEN-YEAR CAPITAL INVESTMENT STRATEGY (billions)**

### **STATE-OF-GOOD-REPAIR**

<i>Infrastructure SOGR .....</i>	<i>\$ 4.25</i>	
<i>Customer Service and New Technology .....</i>	<i>\$ 0.31</i>	
<i>Debt on Equipment Replacement.....</i>	<i>\$ 2.19</i>	
<b>Subtotal .....</b>	<b>\$ 6.75</b>	<b>36%</b>

### **CAPACITY/FREQUENCY**

<i>Increase Core System Capacity .....</i>	<i>\$ 6.09</i>	
<b>Subtotal .....</b>	<b>\$ 6.09</b>	<b>32%</b>

### **EXPAND OFF THE EXISTING CORE SYSTEM**

<i>Debt on Light Rail Expansion Projects .....</i>	<i>\$ 0.95</i>	
<i>System Expansion Program .....</i>	<i>\$ 1.47</i>	
<b>Subtotal .....</b>	<b>\$ 2.42</b>	<b>13%</b>

**OPERATING SUPPORT .....** **\$ 3.56** **19%**

**TOTAL:.....** **\$18.8**

# State-Of-Good-Repair

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The primary goal of the Capital Investment Strategy is to bring the system to a state-of-good-repair. The importance of system expansion projects pales in comparison with the need to maintain the existing system. NJ TRANSIT's existing transit riders rely on the transit system for a consistent level of service. NJ TRANSIT's surveys have shown that riders rank service reliability as one of their top concerns. State-of-good-repair correlates directly with reliable service, which, in turn, correlates directly with customers' decisions to use transit.

Much progress has been made in bringing the transit system to a state-of-good-repair. With such a large system, however, there is still much more work needed to achieve this state system wide. Once state-of-good-repair is reached, there is an ongoing need to maintain the system at that level.

## Rehabilitate Railroad Infrastructure

NJ TRANSIT replaces components of the rail system regularly, based on each component's respective life cycle. "State-of-Good-Repair" is achieved when the infrastructure components are replaced on a schedule consistent with their life expectancy.

- Track – To ensure that it lasts 35 to 50 years, upgrading and replacement of rail, ties, switches and grade crossings must occur as part of a continuous program. Given NJ TRANSIT's 535.6 miles of main line track, 13 miles of track must be replaced every year.
- Structures – With more than 600 bridges, as well as various retaining walls, catenaries and signal structures,

a regular inspection program is followed to determine those bridges and structures in need of repair or replacement. Because NJ TRANSIT inherited an aged rail infrastructure from several bankrupt railroads, it has a backlog of bridges and other structures overdue for replacement.

- Electric Traction – With many electrified rail lines, overhead catenary wire and power substations must be maintained. Except for certain areas such as auxiliary wire, electric traction systems are at "state-of-good-repair."
- Signaling – Regular programmed maintenance and replacement of grade crossing warning systems, train operation signals as well as switching and interlocking signal devices is needed. NJ TRANSIT is also improving rail safety by installing Automatic Train Control (ATC) and Positive Train Stop (PTS) systems throughout the rail network. ATC systems continuously enforce speed limits for the locomotive engineer, while the PTS systems automatically stop a train before it travels through a stop signal
- Work Equipment – A continuous program of repair and replacement of this equipment is needed to properly maintain the rail system.

**NJ TRANSIT Rail State of Good Repair Annual Capital Needs**

<b>BRIDGE INSPECTION PROGRAM</b>			
<b>Component</b>	<b>System Quantity</b>	<b>Life Expectancy</b>	<b>Annual Replacement</b>
Undergrade Bridge Inspection	612	NA	122
<b>BRIDGE PAINTING PROGRAM</b>			
<b>Component</b>	<b>System Quantity</b>	<b>Life Expectancy</b>	<b>Annual Replacement</b>
Bridge Painting	278 Steel Bridges carrying 66,000 Track feet	15 years	4400 track feet
<b>BRIDGE REHABILITATION PROGRAM - OVERHEAD</b>			
<b>Component</b>	<b>System Quantity</b>	<b>Life Expectancy</b>	<b>Annual Replacement</b>
Overhead Bridges	107	50	2-3
<b>BRIDGE REHABILITATION PROGRAM - TIE DECK</b>			
<b>Component</b>	<b>System Quantity</b>	<b>Life Expectancy</b>	<b>Annual Replacement</b>
Tie Decks	131 Open Deck Bridges carrying 46,000 Track Feet	30 years	1550 track feet
<b>BRIDGE REHABILITATION PROGRAM - UNDERGRADE</b>			
<b>Component</b>	<b>System Quantity</b>	<b>Life Expectancy</b>	<b>Annual Replacement</b>
Undergrade Bridge Rehab/Replacement	533 in service	100 YEAR	6
<b>ELECTRIC TRACTION IMPROVEMENTS SYSTEMWIDE</b>			
<b>Component</b>	<b>System Quantity</b>	<b>Life Expectancy</b>	<b>Annual Replacement</b>
Catenary (structure/hardware trolley/Aux./main messenger wire)	240 miles	40 years	6 miles
Signal Power Lines	175 miles	40 years	5 miles
Substations	34 each	50 years	0.5 each
Controls & Navigation lights For Movable Bridge	10 each	20 years	0.5 each
Wayside Power	7 yards	20 years	0.5 yards
Switch Heaters at Interlocking & Yards	183 locations	20 years	9 locations
Station Lighting	150 each	20 years	7 each
<b>M of W EQUIPMENT REPLACEMENT PURCHASE PROGRAM</b>			
<b>Component</b>	<b>System Quantity</b>	<b>Life Expectancy</b>	<b>Annual Replacement</b>
Rail Gang	25 pcs.	7 years	3 pcs.
Tie Gang	40 pcs.	7 years	5 pcs.
Surfacing Gang	21 pcs.	7 years	3 pcs.
Cranes	9 pcs.	15 years	1 pcs.
Backhoes, Excavators	24 pcs.	7 years	3 pcs.
Smaller Equipment	800 pcs.	5 years	30 pcs.

### RAIL SIGNAL AND COMMUNICATION IMPROVEMENTS SYSTEMWIDE

Component	System Quantity	Life Expectancy	Annual Replacement
Interlocking	89	40 years	2.2
Grade Crossing Warning System	315	25 years	12.6
Signals	1,222	40 years	30.6
Locked Switch	666	40 years	16.7
Cable Plant	500	40 years	12.5
Hot Box Detectors (future)	0	15 years	
Cable Plant route miles	300	40 years	7.5
Microwave sites and towers	4	15	0.3
Carrier Equipment	25	15	1.7
Portable Radios	2200	5	440
Base Stations (xmit or rcv)	154	10	15.4
Mobile & train radios	1095	10	109.5
Station Public Address Systems	158	10	15.8
SCADA/SMP Network Equipment	70	15	4.7
PBX Telephone Systems	11	15	0.7
Office/FOC/ICS/Rec./Netwrk/equip	L.S.	15	0.1
Video monitoring/rem ctrl systems	40	10	4
Excludes revenue vehicle PA systems	Note: Communications is not currently at State of Good Repair (projected completion 2009)		

### RIGHT OF WAY FENCING SYSTEMWIDE

Component	System Quantity	Life Expectancy	Annual Replacement
Fencing	5 Miles	30 Years	3- 8' sections

### RIGHT OF WAY IMPROVEMENTS SYSTEM WIDE

Component	System Quantity	Life Expectancy	Annual Replacement
ROW Projects	500 Culverts	100	3-4 projects
Misc. Structures	Retaining walls, (19 miles) catenary and signal structures	100	2-3 projects

### TRACK PROGRAM

Component	System Quantity	Life Expectancy	Annual Replacement
Rail- main line	535.6 miles	35-50 years	13
Rail- yards	61.4 miles	60 years	0.9
Ties- main line	1,539,000 each	30-35 years	53,000
Ties-yard	161,000 each	50 years	2,300
Turnouts	1,267 each	35 years	20
Slip Switches	35 each	10-15 years	3
Road Crossings	328 each	17-20 years	22
Mitre Rails	17 sets	17 years	6
Right-of-Way	System surfacing, Undercutting, Ballast Cleaning, Drainage		
Ties--concrete--Main Line	117 each	50 years	2,300

# Modernize Bus and Rail Fleet

NJ TRANSIT must maintain its fleet of railcars, locomotives, buses and light rail vehicles in good operating condition. In the past three years, the agency has made great strides in replacing what was an aging bus fleet and in expanding its rail fleet. The Capital Investment Strategy provides for lease payments for these past procurements, the purchase of additional multi-level railcars, railcar overhaul and the re-

placement of older equipment. row III self-propelled electric railcars will also require replacement within the next five years.

- **Equipment Overhaul** – Useful life of rail equipment can exceed 25 years, and buses 12 years, if properly maintained and overhauled. Overhauls will be required on 850 cruiser buses, 76 CNG cruiser buses, and 148 Comet III



placement of older equipment.

- **New Equipment** – In order to retire equipment that has exceeded its useful life, NJ TRANSIT purchased 200 Comet V single level rail cars and 1,371 cruiser buses, 85 articulated buses, 289 Metro B buses, 33 new diesel locomotives and plans to purchase 1,200 transit-style buses (200 buses per year on a pay-as-you-go basis) to replace 175 NOVA A, and 650 NOVA B buses, and 319 Metro D buses.

NJ TRANSIT will also replace 42 F40/GP40 diesel locomotives and 230 Ar-

and IV coaches. NJ TRANSIT is currently rehabilitating its fleet of 325 Nova B transit buses.

- **New Minibus Equipment** – The Capital Investment Strategy provides for the purchase of smaller buses to replace those that have exceeded their useful lives.
- **Private Carrier Improvement Program** – The Capital Investment Strategy calls for continued investment in private carrier buses. NJ TRANSIT replaces private carrier rolling stock as part of its regular equipment replace-

ment program. Private carriers received over 500 cruiser buses as part of NJ TRANSIT's recent cruiser bus procurement.

- **Environmental Friendly Bus Purchases** – NJ TRANSIT continues to invest in new buses that have reduced emissions of air pollutants. All NJ TRANSIT transit, suburban, articulated and cruiser buses use either compressed natural gas or ultra-low sulfur fuel or are powered by hybrid-electric powerplants. In addition, NJ TRANSIT's recent procurement of articulated buses included soot filters as will all new NJ TRANSIT bus procurements.

### **Rehabilitate Bus Infrastructure**

In order to ensure that our bus infrastructure is in a state-of-good-repair, NJ TRANSIT is committed to rehabilitating our bus facilities in a timely manner. The Capital Investment Strategy calls for rehabilitating approximately 10 of our 15 bus garages and the construction of a new garage in northern, N.J.

### **Rehabilitate Stations and Terminals**

A key ingredient to attracting more riders to transit is improving the agency's "front door," its train stations and bus terminals. A number of NJ TRANSIT's train stations and bus terminals need improvement. The Capital Investment Strategy calls for significant funding to bring these facilities to a state-of-good-repair. In addition to attracting more people to transit, making train stations into showcases for the community improves quality of life in the towns and cities that host transit facilities.

Improvements will make train stations more accessible to people with disabilities, parents with children in strollers, and the growing population of senior citizens (65+), which is expected to increase by 39%, compared to a population growth of 16% through 2020.

# Renew Technology

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NJ TRANSIT will invest in advanced technology in order to improve customer service, enhance security and operate more cost-effectively. One of the critical systems that help advance these three goals is a smart card program. Although NJ TRANSIT has made great strides in improving interconnectivity of rail, bus and light rail services, ticket collection has not changed in over 100 years. If NJ TRANSIT is to become a system that serves more than commuters, it must have a fare collection medium that is more flexible, quicker and easier to use.

A smart card program will be implemented for the state's transit system. Riders will be able to board any bus, train or light rail vehicle using a common fare card and use it to transfer easily from bus to train and train to light rail. Fares could be deducted from the stored value on the card and the card's value could be replenished automatically from a credit card, like the EZ Pass system.

Smart card technology also makes back office operations more efficient, saving NJ TRANSIT administrative costs. The Capital Investment Strategy anticipates implementation of a smart card system along with other technology improvements designed to improve efficiency and reduce administrative overhead.

# Expand Capacity, Increase Frequency

## Construct a New Trans-Hudson Rail Tunnel

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The greatest bottleneck on NJ TRANSIT's rail network is the section of track between Newark and New York. Trains from five feeder lines converge on this section which constricts to two tracks, one inbound and one outbound through the nearly 100 year old tunnels beneath the Hudson River. Over half of all NJ TRANSIT rail riders pass through the existing tunnels, making the lines that serve New York Penn Station among the agency's highest performers. Demand for rail service to Midtown Manhattan has tripled during peak periods since 1983. As demand continues to increase, some time between 2010 and 2020, there will be insufficient capacity to provide for the trans-Hudson commute. The constraint on rail service to Midtown is also restricting intra-state rail service as well since the various lines converge before and after Newark on the approach to the Hudson River Tunnel.

NJ TRANSIT is taking steps to address capacity concerns in the trans-Hudson tunnels. It implemented a new signaling system to increase the throughput of the tunnel and is purchasing multilevel railcars. These efforts can only go so far, however. Once all of these interim efforts are exhausted, the only remaining option is to construct new trans-Hudson rail tunnels.

New tunnels will increase the number of trains into Manhattan, doubling trans-Hudson capacity and providing for a richer rail service in New Jersey. This added capacity will also improve the commuter bus system into Manhattan, by shifting some of the growth in bus riders to rail, thereby providing relief to the Express Bus Lane (XBL) and the Port Authority Bus Terminal (PABT) system. Forecasts for 2020 show that this shift is needed to keep bus travel

times the same or better than today.

The Port Authority of NY&NJ is primarily responsible for the XBL and PABT. NJ TRANSIT is working with the Port Authority to provide the necessary trans-Hudson bus capacity on the Route 495 approach to the Lincoln Tunnel, the tunnel itself and the Bus Terminal. Among the issues to be addressed are: where to stage buses for outbound moves, their storage, and movement into the Bus Terminal in the evening.

The Capital Investment Strategy calls for other core capacity investments in the rail system. On the Northeast Corridor, new station capacity will have to be constructed in proximity to the Penn Station New York complex, along with new yard capacity to accommodate a larger rail fleet.

# Expand Park & Ride Capacity

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Access is an essential element of any transit system, particularly one constrained by insufficient parking capacity. Parking expansion improvements are targeted toward facilities with the greatest unmet demand.

Use of feeder shuttle buses will also reduce demand for parking and extend the geographic reach of transit.

NJ TRANSIT expanded parking at Clifton Rail Station (228 spaces), 300 commuter spaces at the Rahway Train Station, expanded the Allwood Bus Park/Ride by 285 spaces and Plauderville Park/Ride by 230 spaces, and opened the new Tonnelles Avenue Park/Ride on the Hudson Bergen Light Rail line, providing 730 spaces.

The Capital Investment Strategy calls for park and ride improvements at the Hamilton Station Deck (1,900 spaces), Edison Station (700 spaces), Route 23 Park/Ride (1,100 spaces), Morristown Station Deck (118 spaces) and South Amboy Parking Deck (600 spaces). Park and ride improvements at Mount Arlington Station (50 spaces) are also included in the CIS.

## Expand Rail Fleet and Rail Yard Capacity

In order to improve frequency of service, additional equipment must be procured. NJ TRANSIT has taken delivery of 29 new electric locomotives and has ordered 100 Port Authority-funded multilevel railcars targeted for revenue service in late 2006 on NJ TRANSIT'S busiest lines. Each multilevel car has up to 18% more seating than conventional single level coaches. 131 ad-



ditional multilevel railcars will be needed to expand trans-Hudson rail capacity to meet demand in this decade. With the recent order of the additional multilevel cars, NJ TRANSIT will have sufficient rail equipment on hand to meet its needs for the next five years.

With the increase of rail fleet, NJ TRANSIT is faced with having to provide additional facilities to store and maintain rail equipment. In March 2004, NJ TRANSIT opened a new facility located in Falls Township, PA to accommodate rail equipment on the Northeast Corridor. When the second phase of the facility is completed, NJ TRANSIT will have the capacity to store and maintain up to 250 rail cars.

The Capital Investment Strategy calls for additional rail crew quarters, pedestal tracks/yard improvements, and the construction of S&I facility.

## Coordinate Bus and Highway Investments to Improve Bus Service

Bus operations are severely impacted by highway congestion. NJ TRANSIT and NJDOT are working to ensure that highway improvements make bus service quicker and more reliable.

# Expand Reach of the Transit System

## Expand Off the Existing System

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The Capital Investment Strategy also provides for a limited number of system expansions. These expansions build off the current rail and light rail system in ways that improve efficiency of the network and expand the number of destinations for both existing riders and new riders.

Several projects are currently being advanced through the federally prescribed planning process for possible future investment. They are:

- Northern Branch DMU
- Hudson Bergen Light Rail Extensions
- Bergen-Passaic Rail Line
- Lackawanna Cut-Off
- Monmouth-Ocean-Middlesex (MOM)
- West Shore Line
- West Trenton Line
- Union County LRT
- New York, Susquehanna and Western (Hawthorne west)

It is expected that they will be through that planning process and able to be implemented within this ten-year period. These projects to varying degrees will increase ridership, geographic coverage and address other needs. The CIS anticipates the advancement of some of these projects.

Planning efforts are also underway for other projects, such as a bus rapid transit system for the Greater Princeton Area and rail service to the NJ Sports Complex and surrounding area.

Critical to advancing the projects listed above are how well they complement NJ Transit's core system and their ability to attract new riders. A few of these projects, such as the West Shore Line, West Trenton Line, Lackawanna Cut-Off and Monmouth-

Ocean-Middlesex, fulfill their full potential only if capacity is added to the Northeast Corridor, a new tunnel is built under the Hudson River, and station capacity is added in New York City.

NJ TRANSIT is prepared to advance portions of these projects that meet these general criteria:

- Meet FTA requirements – necessary to be eligible for federal funding
- Generates sufficient ridership – new riders, not just transfers from other transit services which significantly reduces air pollution, congestion and improves accessibility
- Generates sufficient revenue – the combination of farebox and any other possible revenue sources covers enough of the operating costs
- Physically feasible – project can be constructed in accordance with applicable codes and design standards
- Operationally feasible – operating plan makes practical sense and can be implemented
- Benefit/Cost ratio – the projected public benefits exceed the capital and operating cost

Because transit requires concentrations of activity, it almost always is consistent with Smart Growth. However, attention must be paid to whether proposed expansion of transit services will promote development that is inconsistent with the state's policies concerning Smart Growth.

# Conclusion

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The investments outlined in The Capital Investment Strategy will deliver a substantially enhanced transit system, one with greater reach and richer and more reliable service.

- Continued investment in transit promotes economic development by bringing more of the state's residents to their places of employment and by making it more attractive for businesses to locate in the Garden State.
- It promotes the principles of smart growth by connecting train stations and transit hubs to the communities and businesses that they are a part of – such that transit can serve as an anchor for commercial development in an attractive and livable environment.
- It ensures that the existing transit system achieves a state of good repair.
- It combats congestion by targeting sound and attractive transit alternatives in highway corridors with chronic traffic conditions.

As NJ TRANSIT implements its Capital Investment Strategy, it will attract more people to use transit and encourage those who already use the system to use it more frequently and for more purposes. When transit service becomes more frequent and reliable, and offers more destinations that people want to go to, people will begin to think of using transit for more than simply commuting to work. Implementing the Capital Investment Strategy will make New Jersey's communities more livable, its roads more tolerable and its businesses more profitable. The Capital Investment Strategy will deliver the kind of transit sys-

tem that New Jersey needs to prosper in the 21<sup>st</sup> Century.